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# Original Articles

## Insulin and Its Use in Surgery


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The question in the minds of many surgeons is, of what value can insulin be in the treatment of surgical conditions in diabetic patients?

Although insulin offers more to diabetics than anything heretofore discovered, it does not cure.

Insulin, to be effective, must be accompanied by a properly regulated and balanced diet. Disregard of dietary regulations when using insulin is fraught with danger.

Diabetes has been robbed of some of its terror by insulin. It is a remedy which permits a surgical operation to be performed on a diabetic with a greater degree of safety.

In the past decade surgery in diabetics has been more successful because of earlier diagnosis, better surgical technique, more prompt surgical interference, and a better understanding and regulation of the diet.

Diabetic patients who do not respond satisfactorily to dietary measures require insulin. In proper dosage insulin reduces and maintains blood sugar at normal levels. It abolishes glycosuria, acetone bodies, and also causes a rise in the respiratory quotient.

*Surgery and Diabetes Mellitus.*—Surgeons and physicians, because of the unsatisfactory results obtained by operative interference in diabetic patients, sometimes delay surgical procedures, which in non-diabetic patients would be resorted to early, and with favorable results. Diabetic patients, as a group, require surgery more frequently than non-diabetic patients, because the disease either predisposes to or aggravates an existing infection.

The most common surgical complications of diabetes mellitus are gangrene and furunculosis. Diabetic patients may develop other conditions requiring surgery, not complications of diabetes; for example, acute appendicitis, cholecystitis, pelvic conditions in women, strangulated hernia, and cancer.

It is obvious that acute surgical conditions which demand immediate operative interference, without sufficient time to study the diabetic condition and to institute proper preoperative dietary measures, carry the greatest risk.

*Diabetic Patients as a Surgical Risk.*—The diabetic patient is not a good surgical risk. This danger may be greatly reduced by attention to the following points:

An early diagnosis and prompt surgical interference.

If there is no improvement by the best non-surgical treatment of gangrene, surgery must be resorted to promptly.

The choice of anesthetic and its proper administration.

The diet during the preoperative and postoperative periods.

The use of insulin, if indicated.

Other factors which determine the degree of risk are: the age of the patient, the severity of the diabetes, the presence or

absence of acidosis, and, most important, the general condition of the patient (blood-vessels, heart, and kidneys).

The early recognition of complications requiring surgical interference is most important in diabetic patients because infection reduces carbohydrate tolerance and predisposes to acidosis. Local infection in a diabetic, such as erysipelas, may develop into a blood-stream infection, which is likely to be fatal. Gangrene occurs more frequently in patients beyond the age of fifty years. It is apt to be found in mild diabetics who have had the disease for some time. These patients usually show a considerable amount of sclerotic changes in their blood-vessels. They may complain of numbness, twitching, and coldness of the extremities before gangrene is evident.

The treatment of gangrene should be dietary, if necessary, supplemented by insulin. If there is no improvement from the use of these measures, time should not be wasted, but surgery resorted to at once. Severe pain, associated with gangrene, usually demands immediate operation.

*Anesthesia.*—Some of the unfavorable results following surgical operations have been attributed to improper diet preceding the operation. Studies have revealed that the anesthetic and not the diet has been responsible for the acidosis and the coma.

There is a general agreement among surgeons and anesthetists that the ideal general anesthetic for diabetic patients is nitrous oxide and oxygen.

Ether is the next best, especially when freely diluted with air or oxygen.

Chloroform is a distinct poison to the body cells, especially to the liver, favoring the development of acidosis and coma.

The ability of the body to utilize carbohydrate is impaired by the use of ether and chloroform, more so by the latter.

Next in importance to the selection of the proper anesthetic is the amount of anesthetic used and the duration of the anesthesia.

The shorter the duration of the state of anesthesia, the less is the danger to the patient.

Ether has been used successfully by many surgeons. It has also been the agent which, as a result of too deep a degree of anesthesia, or when given over a considerable length of time, caused acidosis, diabetic coma, and death.

Postoperative nausea resulting from ether anesthesia interferes with the early ingestion of liquids and food.

Morphine and atropine, given prior to operation, will allay the patient's apprehension and shorten the period of anesthesia.

Surgeons skilled in the use of local and spinal anesthesia have obtained excellent results, especially with the latter. Local anesthesia, used in connection with a general anesthetic, may be of service by reducing the amount of general anesthetic needed.

*The Dietetic Treatment, With or Without the Use of Insulin, in Preparation of a Patient for an Emergency Operation.*—If the diabetic patient needs an operation immediately, or within less than twenty-four hours, it is not advisable suddenly to restrict the carbohydrate of the diet. This is true more particularly in the severe diabetic, the obese, and in elderly patients. The danger does not lie in the degree of glycosuria or hyperglycemia present, but in the development of acidosis eventuating in diabetic coma. The presence of an infection and the use of a general anesthetic predisposes to acidosis.

The treatment under these circumstances should aim to supply the patient with carbohydrate in some readily assimilable form, such as oatmeal gruel, orange juice, cereals, orange albumin, grapefruit, and skimmed milk. If the liver has sufficient carbohydrate stored, acidosis is less likely to develop.

Acidosis may be prevented in a patient having glycosuria and a blood sugar in excess of 0.25 per cent by giving, subcutaneously, 5 units of insulin. This dose may be repeated in one hour and then at two-hour intervals until glycosuria is abolished and the blood sugar is reduced to normal limits. The urine should be examined and the blood-sugar percentage ascertained at the end of one hour to determine the effect

of the insulin and the necessity of repeating the injections.

The presence of acidosis and its degree is determined by the estimation of the volume percentage of $CO_2$ in the blood.

When the volume percentage of $CO_2$ in the blood falls below 30 the degree of acidosis is considered severe.

Two methods are available for the treatment of acidosis, namely, diet regulation, or diet regulation supplemented by the use of insulin. Only the mildest form of acidosis should be treated by diet alone.

To prevent the development of acidosis it is necessary to balance the diet of all diabetic patients so that the ratio between the ketogenic and the antiketogenic shall not exceed that described hereafter.

Acidosis accompanying glycosuria may be treated by supplying the body with moderate amounts of carbohydrate, usually in the form of the juice of an orange, alternating with 6 ounces of oatmeal gruel every two or three hours. Fats must be discontinued and protein taken in small quantities or entirely eliminated. The volume percentage of the $CO_2$ in the blood should be determined at two-hour intervals. The excessive amount of carbohydrate in the blood and tissues, when properly utilized by the body, will abolish the acidosis. If, by this plan of diet and regulation, the acidosis shows no tendency to disappear, 5 units of insulin, if necessary increasing the dose to 10 units or more at the end of two hours and repeating the dose at two-hour intervals, will usually eliminate the acidosis.

In the presence of infection it is exceedingly difficult, often impossible, except by considerable starvation, to render the urine of the patient sugar-free. We aim to remove the infection, which when accomplished increases the ability of the body to utilize carbohydrate.

A diabetic with normal kidneys, and without glycosuria, may show acidosis as the result of prolonged or severe restriction of food as seen in the rigid starvation diet. This form of acidosis usually is not dangerous and is readily abolished by increasing the carbohydrate content of the diet. If the starvation is due to vomiting, glucose in salt solution may be given by bowel.

*The Dietetic Treatment, With or Without the Use of Insulin, in Preparation for Surgical Operations Not of an Emergency Nature.*—It is most desirable to bring the patient to operation in the best condition possible, viz., blood sugar as nearly normal as possible, no glycosuria, and no evidence of acidosis.

A number of different methods of diet regulation have been used successfully, the principle in general being based on undernutrition. If the diet does not satisfactorily control the diabetic condition insulin is indicated.

We have found the following plan of treatment most useful in arriving at the proper number of grammes of carbohydrate, protein and fat required by the patient. The patient is placed on a maintenance diet which is based on the normal basal caloric requirement calculated for the age, height, weight, and sex of the patient. The diet is so computed and balanced that nitrogenous equilibrium is maintained. The amounts of carbohydrate and of fat are present in such proportions as to avoid excessive development of acetone bodies. Patients are kept in bed for a variable period after admission, and later on are allowed different degrees of exercise. Daily examinations of the twenty-four-hour output of urine and of the blood are made to note the effect of the diet.

The maintenance diet expressed by M in the accompanying chart is arrived at by multiplying the caloric requirements per day for the sex and age by the surface area of the body expressed in square meters. The number of square meters of body surface is arrived at by noting the point on the scale where the line indicating the height of the patient, expressed in inches, crosses the line recording the weight of the patient, expressed in pounds.

The amount of protein (P) in the maintenance diet is equal to, not less than, ⅔ gramme per kilogramme of the body weight of the patient. Many patients will do better if 1 gramme of protein is allowed

for each kilogramme of weight. The amount of carbohydrate is determined by subtracting ten times the amount of protein (10 P) from M, the number of calories, and dividing this result by 30.

The number of grammes of fat needed equals the number of calories required (M) divided by ten, minus the number of grammes of protein (P) divided by 2.

## Method for Estimating Diabetic Diets

### Surface Area Chart (Du Bois)

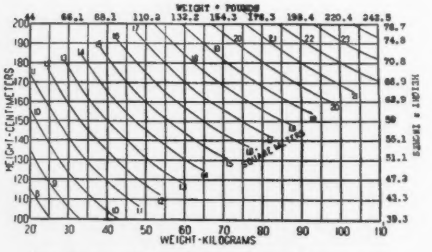


Chart for determining surface area in man in square metres. Example: Weight 154.3 lb., Height 70.8 in. = 1.88 sq. m.

**Caloric Requirement per square metre of body surface (Aub-Du Bois)**

| AGE | MALES | | FEMALES | |
|---|---|---|---|---|
| Years | Cal. per Hour | Cal. per Day | Hour | Day |
| 10-12 | 51.5 | 1236 | 50 | 1200 |
| 12-14 | 50 | 1200 | 46.5 | 1116 |
| 14-16 | 46 | 1104 | 43 | 1032 |
| 16-18 | 43 | 1032 | 40 | 960 |
| 18-20 | 41 | 984 | 38 | 912 |
| 20-30 | 39.5 | 948 | 37 | 888 |
| 30-40 | 39.5 | 948 | 36.5 | 876 |
| 40-50 | 38.5 | 924 | 36 | 864 |
| 50-60 | 37.5 | 900 | 35 | 840 |
| 60-70 | 36.5 | 876 | 34 | 816 |

*Formulas for calculating food requirement in grams from Caloric Requirement (M) (W. R. Campbell)*

P = 2/3 gm. per Kg. body weight.

$$C = \frac{M - 10P}{30}$$

$$F = \frac{M}{10} - \frac{P}{2}$$

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If the patient upon this diet shows a sugar-free urine with a blood-sugar percentage within normal limits, the carbohydrate and fat are increased during a week or ten days in proper ratio until the patient is taking from 600 to 800 calories more than basal requirement (M). A diet containing this number of calories is usually sufficient for a patient to perform work requiring a moderate amount of physical and mental effort.

Insulin is indicated if the patient has glycosuria and hyperglycemia on the maintenance diet. By collecting as separate specimens all the urine voided following each meal the amount of carbohydrate not utilized can readily be calculated. For every 2 gm. of sugar excreted in the urine, following a meal of known number of grammes each, of carbohydrate, protein, and fat, 1 unit of insulin can be administered. More or less than this amount may be required to control the blood sugar and the glycosuria. In severe diabetics it may be necessary to administer the insulin before each meal, but in the average case requiring insulin one or two doses daily usually suffices.

The frequency of giving insulin may be reduced by concentrating the carbohydrate in one or two meals, rather than an equal distribution over three meals.

Breakfast and the evening meal may contain the greatest amount of food, and sufficient insulin, given one-half hour before these meals, will control the glycosuria.

Severe cases of diabetes have required in addition to the dose of insulin before each meal an additional dose at midnight. The frequency of administration of insulin injections is determined by the information furnished by numerous blood and urine examinations.

*Diabetic Coma.*—Coma, in diabetics and in individuals who show glycosuria, may be due to other causes than an excessive amount of *B*-oxybutyric acid, diacetic acid, and acetone. It is, therefore, important to be certain that the coma is due to diabetes and that it is not uremic, or of the type seen in the preagonal stages of other conditions. A patient dying from a brain tumor, the comatose state of severe acute infections, possibly with glycosuria and hyperglycemia, has been erroneously diagnosed diabetic coma.

Coma is responsible for the greatest number of deaths, so we must prevent its development.

The rules which the patients of Joslin[1] are taught and follow at the New England Deaconess Hospital are so excellent that they are quoted verbatim:

1. Go to bed whenever indisposed.
2. Secure some one to wait upon you.
3. Drink a glass of liquid each hour, such as coffee, tea, broths, diluted orange juice, water, oatmeal gruel.
4. Move the bowels by enema, and if liquids have not been retained by mouth follow the enema by an injection of one

[1]Joslin: Treatment of Diabetes Mellitus, 3rd Ed., Lea & Febiger, Philadelphia, 1923.

pint of lukewarm water containing a teaspoonful of salt.

5. For nourishment depend upon orange juice and water, oatmeal gruel.

6. Send for the doctor, who, if he finds the symptoms of diabetic coma are really present, will give

7. Insulin.

8. Digitalis, caffeine, or circulatory stimulants, and perhaps

9. Wash out the stomach, or

10. Give salt solution under the skin.

The tissues of a patient during the precomatose state must be abundantly supplied with fluids. They are introduced into the body by mouth, enteroclysis, or hypodermoclysis. In this manner a maximum amount of fluid may be given with the minimum amount of disturbance to the body. The fluid given by bowel or by hypodermoclysis may be sterile water or salt solution. Orange juice, oatmeal gruel, glucose and water, weak tea, coffee, or water should be given by mouth, so that the patient will have an average fluid intake of 150 cc each hour.

If the patient's condition does not improve by this plan of treatment, additional measures must be employed. It is obvious that the source of infection must be removed early if acidosis and coma are to be prevented. The patient to be operated upon should have his tissues filled with fluid. At the time of operation salt solution may be given by hypodermoclysis before the patient leaves the operating-room table. During acidosis and coma the urinary output lessens, and with recovery there is a notable increase.

Diabetic coma is very insidious in onset. One must always be on the alert to discover any of the premonitory symptoms. The slightest change in the patient's condition should always suggest the possibility of coma. It develops when there is not sufficient carbohydrate utilized to completely metabolize the fat.

Insulin is preëminently the remedy of choice because it assists the body to utilize carbohydrate and should be administered as soon as the patient is seen.

Insulin given any other way than by hypodermic or intravenous injection has not been productive of satisfactory results. Intravenous injection is used only in diabetic coma.

Having definitely decided that the coma is diabetic in origin, and not due to other causes, the patient is given 10 to 20 units of insulin subcutaneously or intravenously, having previously taken blood to determine the volume percentage of $CO_2$ concentration and the percentage of blood sugar. During coma if any food is given it should be carbohydrate.

It is the practice of some physicians, in order to avoid hypoglycemic reactions, to give ½ to 2 grammes of glucose or levulose for each unit of insulin at the time of injection. The insulin injection is repeated in an hour, specimens of blood and urine being examined hourly to note the effects of the insulin.

If diabetic coma is recognized early and promptly, small doses of insulin will be needed.

Diabetic coma, treated in the later stages, has been fatal even though insulin lowered the blood sugar, restored the alkali reserve, and rendered the urine sugar-free. The explanation for the failure of insulin to save life is that the ketone bodies had damaged the body cells beyond their ability to recover.

Following the injections of insulin the blood sugar may not drop at once and there may be cumulative effects of the insulin. For this reason one must carefully watch the result, or the patient may suddenly be plunged from the state of coma into the hypoglycemic state, which, if unrecognized, may be fatal. Some patients improve clinically, with little change in the blood-sugar percentage. After the patient has improved sufficiently, the dosage of insulin should be reduced and the intervals of administration prolonged.

Insulin must be continued for days following recovery from coma, and the diet slowly increased to balance the effects of insulin, in the manner described.

The use of alkalies in the treatment of

diabetics has been very general, with questionable results. Bicarbonate of soda can be given by mouth in small doses if the stomach is not irritable, by the intravenous route, in a 2- or 3-per-cent aqueous solution, and in the same strength by enteroclysis. A total intake of 30 to 35 grammes of bicarbonate of soda in twenty-four hours is usually sufficient if any good is to be derived from this treatment.

Insulin may fail:

1. When not accompanied by proper diet.
2. If the source of infection is not removed effectively and properly.
3. When coma has existed beyond the period of reclamation, the acid intoxication having damaged the body cells, rendering them incapable of recovery.
4. In the treatment of coma if not diabetic in origin.
5. In glycosuria or acidosis not associated with hyperglycemia. Under these conditions insulin may produce dangerous reactions by the development of hypoglycemia.

# Electrothermic Methods in the Treatment of Neoplasms and Other Lesions, with Clinical and Histological Observations[1]

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It is quite obvious that one who depends upon a single method in the treatment of malignant disease may not hope to obtain anything but a limited degree of success.

Experience has taught us that operative surgery, electrothermic methods, radium, and *x*-rays are all factors of such importance that none of them can be eliminated from our armamentarium if the maximum of success is to be realized.

All of these methods are employed in our institution, either alone or in combination, to meet particular indications; and we have learned from experience that, if it were necessary to eliminate any one of them, we should be seriously handicapped in our work.

The status of surgery, radium, and the *x*-rays is well-known, owing to the wide and continuous propagation of knowledge concerning them in medical schools, and through the writings of capable exponents. Permanent recognition of these methods is assured since their value has been demonstrated by numerous critical tests.

Knowledge concerning electrothermic methods is, however, not so general, owing, perhaps, to meager teachings in medical schools, to a dearth of authentic literature upon the subjects, to prejudice against any method employing electricity, to want of standardized and efficient equipment, to improper technique (hence poor results and fallacious conclusions), and to the failure of the comparatively few who do employ them correctly to report their work in a convincing manner.

Experience over a period of many years has definitely demonstrated to us the extreme importance of electrothermic methods. We consider them as second to none and, indeed, in many emergencies superior to all.

Thus, the strong conviction that the importance of these methods of attack

[1]From the Clinical and Research Departments of the William L. Clark Hospital. Read before the Radiological Society of North America at the Mayo Clinic, Rochester, Minn., December 5, 1923.

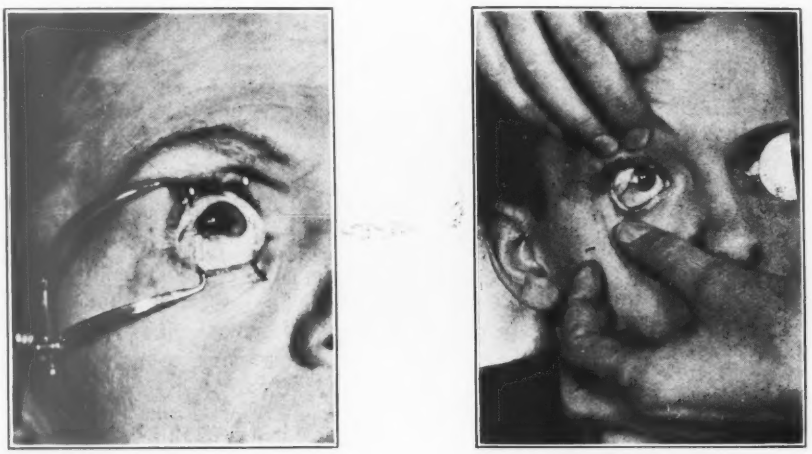
should be emphasized has inspired the present contribution, which will be devoted to the rationale, equipment, technique, clinical and histological observations, with indications for, and contraindications to, their employment. The types of cases in which these methods stand supreme will be stressed with the hope of encouraging serious consideration of their unique advantages, and of demonstrating a sound clinical and histological basis for their employment.

To avoid confusion, and that our terms may be clearly defined, we emphasize that fulguration (as originally described by deKeating Hart), thermocautery, galvanocautery, and electrolysis are entirely dissimilar and, in our experience, inferior to the methods under discussion.

Two definite tissue changes, produced by high-frequency currents, will be considered. These we classify descriptively, in accordance with the actual effects produced in the tissues, as desiccation and coagulation, respectively.

By the desiccation method benign or malignant growths of small or moderate size may be destroyed through the utilization of heat of just sufficient intensity to desiccate, or dehydrate, the tissue. The heat is produced by a monopolar high-frequency current of the Oudin type, the current being conducted to the lesion by means of a steel needle, or other pointed metallic applicator. A single spark-gap is employed in the circuit. The desiccation effect, as originally described, was produced by a high-tension static current transformed into a high-frequency current of suitable quality by means of Leyden jars of sufficient capacity, and a resonator supplying the proper inductance. However, since the advent of the modern transformer type of high-frequency machine, it has been found that desiccation can be satisfactorily produced with this latter apparatus. The principal disadvantage of the former lay in the fact that static currents, being influenced by atmospheric conditions, are often not available in humid weather. High-speed static machines are also expensive, and occupy considerable floor space. Modern high-frequency apparatus is, on the other hand, compact, comparatively inexpensive, and uninfluenced by weather conditions.

There is an impression among many that the desiccation and the coagulation methods are one and the same. This is an error, since the effects produced upon the tissues are quite different. This can readily be demonstrated both clinically and histolog-



A B

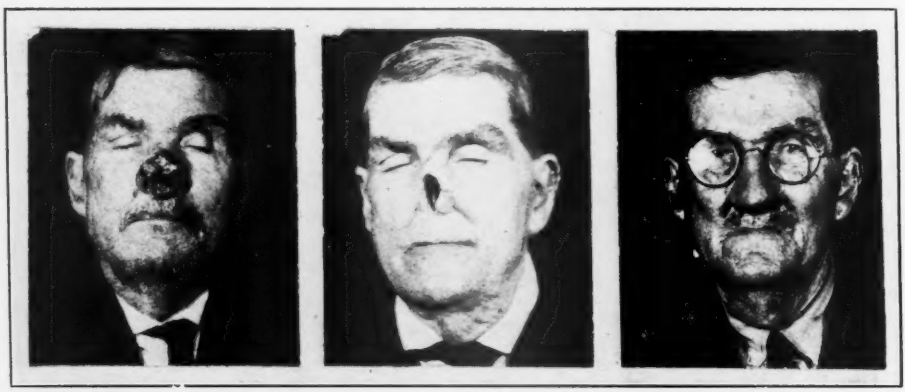
FIG. 1.—A. Small round cell sarcoma of bulbar conjunctiva and cornea. B. Result of one desiccation treatment under local anesthesia. There is no perceptible scar, and no impairment of vision.

ically. The Oudin current, by which desiccation is produced, is of relatively high voltage and low amperage; whereas the d'Arsonval current, by which coagulation is produced, is of lower voltage and higher amperage.

A milliamperemeter cannot be used to measure a monopolar current. The proper current strength necessary to destroy growths of different types and sizes can be learned only by experience. The desiccation effect may be produced in the tissues by delivering the current through a short air space, by just touching the surface, or by inserting the needle more or less deeply, depending upon the degree of destruction desired.

The desiccation method is used advantageously when the lesion is localized and when good cosmetic results are not only desirable but essential. It is subject to such perfect control that an exceedingly small growth even on the cornea may be successfully treated without impairment of vision by the subsequent formation of scar tissue; or a small growth on the vocal cords may likewise be destroyed without impairing phonation. The comparatively slight trauma to the tissues and the little secondary inflammation explain, from a histological standpoint, the slight scarring and the success obtained in treating these delicate structures.

Other conditions successfully treated by the desiccation method are localized benign growths of the larynx, bladder, or rectum. Equally good results are obtained in lesions as refractory as corneal ulcers, pterygium, and trachoma. Minor gynecological conditions, such as cervical erosions, urethral caruncles, etc., yield readily to desiccation treatment. Moles, papillomata, angiomata, nevus pigmentosis, leukoplakia, lupus vulgaris, and erythematosus further exemplify the great variety of pathological conditions where this method may be successfully used. The desiccation method is also an important factor in the treatment of malignant lesions of skin and mucous membranes.



A B C

FIG. 2.—A. Squamous cell epithelioma of the nose, upper lip, and septum. B. Result of one desiccation operation under local anesthesia. C. Artificial nose attached to spectacle frames.

It is further desirable to give special mention of this method in the treatment of hemorrhoids and infected tonsils. In the case of hemorrhoids the patient is prepared in the usual manner. A one-half of one-per-cent solution of procaine is used for local anesthesia, by standard technique. The sphincter is then dilated and the hemorrhoids pulled down by means of tenaculæ and clamped in the direction of the muscle fibers, as in the clamp and cautery operation. The desiccation current is then used to destroy the hemorrhoids. Because of the deeper sealing of the hemorrhoidal veins, hemorrhage is practically eliminated. The minor trauma to

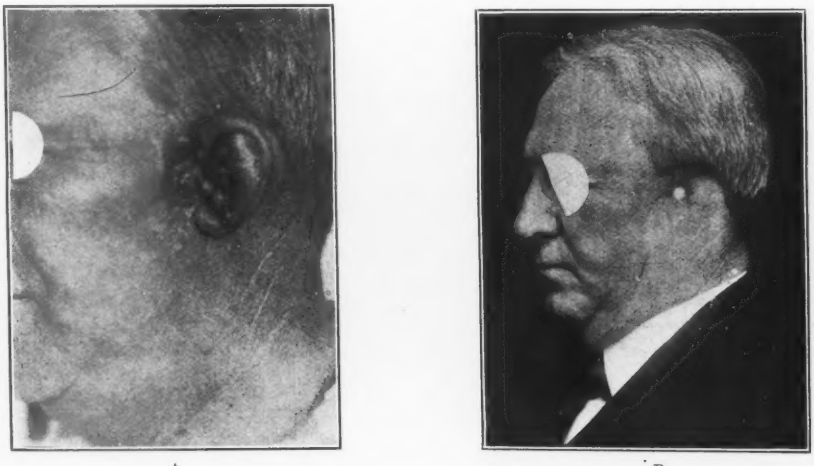
which the tissues are subjected induces but a mild local inflammation; hence little postoperative discomfort and no unpleasant sequelæ, such as contracted cicatrix with subsequent stenosis. This method has, in

FIG. 3.—Typical picture of chronic *x*-ray keratoses of the fingers and hand, with the development of a squamous cell epithelioma. In these lesions no method has proven so satisfactory, in our experience, as the desiccation method.

our experience, simplified the treatment of even the worst cases of hemorrhoids.

Surgical tonsils in adults, in which there is some constitutional contraindication to surgical enucleation, can be very satisfactorily treated by the desiccation method. The operation may be performed with the patient seated. The reflexes in the throat are inhibited by the topical application of a ten-per-cent solution of cocaine, and the tonsils, which are not ordinarily very sensitive, are sufficiently anesthetized by the application of the same solution. A portion or the whole of the tonsil may be sterilized and, if desired, destroyed down to the capsule. Tonsillectomy may be done quite as radically as by any other surgical method, with the advantage that the patient suffers only slight postoperative discomfort. There is no contracted cicatrix, no impairment of voice, and the results are comparable to, indeed surpass, any other method of which we are cognizant. An article appeared in a recent issue of the *Journal of the A. M. A.* in which electrocoagulation was condemned in the treatment of surgical tonsils. The fact is that electrocoagulation should not have been used in the treatment of infected tonsils. Had the writer been familiar with results obtained with the milder desiccation method, he would have been as enthusiastic over the good results thus obtained as he was severely critical of the others.

Coagulation is produced by a bipolar high-frequency current of the d'Arsonval



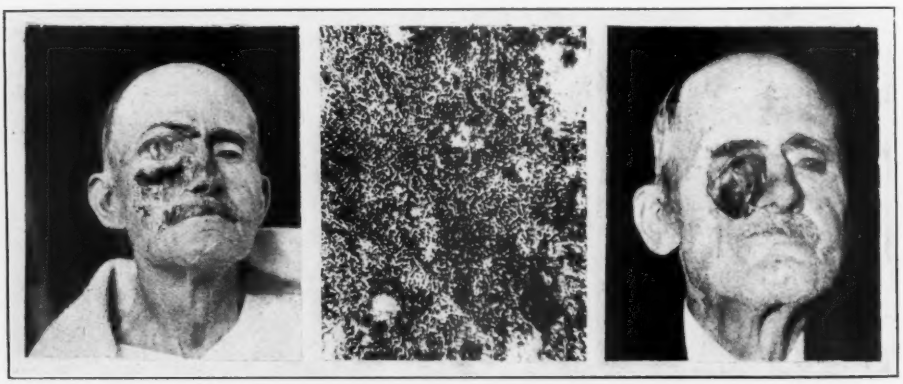
A B

FIG. 4.—A. Basal cell epithelioma involving the ear and surrounding tissues, the mastoid bone, and the ear canal almost down to the tympanum. B. Demonstrating refinement of control and the result of one desiccation operation under ether anesthesia. Both facial nerve and hearing were conserved.

type, utilizing a multiple spark-gap. It is more penetrating and intense than the desiccation method and, in accessible locations, is utilized to destroy larger growths, even those involving bone.

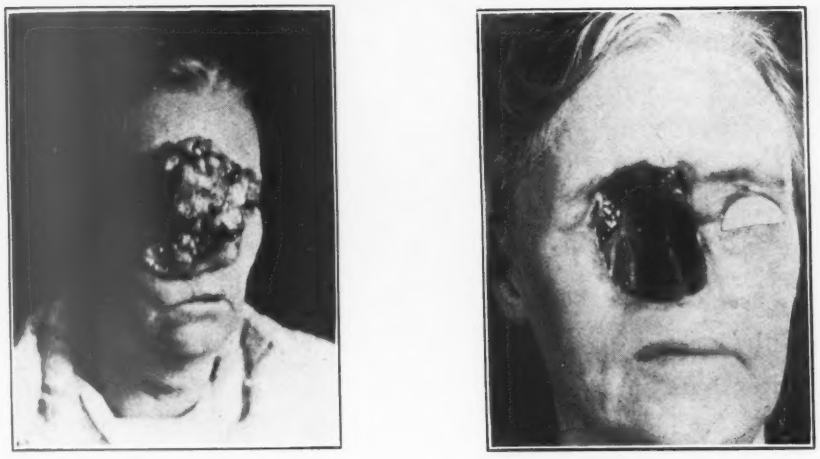
There are many variations of technique in the application of this method to suit the requirements of the individual case. These cannot well be described, but must be learned by practical experience. It may be stated, however, that the active electrode should always be pointed. Steel sewing needles of various lengths may be thus employed, or, if still greater length is required, steel knitting needles, or stiff wire cut to any length, may be used, either straight or curved, so as to be adapted to particular anatomic locations. Since the effect of high-frequency currents is entirely thermic and not electrolytic, it matters not what metal is used. As it is not possible to thoroughly insulate these electrodes, care must be taken that only such tissues as are undergoing treatment shall be touched. The indifferent electrode, which is necessary in this method, may be of any material that will conduct electricity, such as a metallic plate, or, as we prefer, a moistened asbestos pad. This should be placed in close contact with the skin of the patient's back. Both the active and indifferent electrodes are connected by insulated wires to either side of the d'Arsonval winding of the high-frequency machine. Good contact in all the circuit connections is of great importance. A meter should be connected in this circuit as a guide to the current strength employed, which varies, according to the size of the growth to be treated, from about 200 to 2500 milliamperes. The meter is, however, not an infallible guide in estimating the action of the current, since the reading is also influenced by the size of the patient under treatment, or, in other words, by the amount of resistance in the circuit.

Doyen's method of coagulation consisted in the use of a blunt metallic electrode upon the growth, and another of the same or larger size at some point near the growth. It has, however, been found that the control by this technique is imperfect, and experience has taught us that the pointed active and the large passive electrode is a superior method of application. While the current is passing the needle may either touch the surface of the growth or be inserted into it, depending upon the depth of destruction desired. In the case of pedunculated growths, a metal snare may be used to advantage as the active electrode. As already stated, the d'Arsonval current, by which coagulation is produced, is of relatively low voltage and high amperage. If a short air space intervenes



A B C

FIG. 5.—A. Large round cell sarcoma involving face, the antrum, the malar bone, the floor of the orbit, the ethmoid, as well as all the tissues within the orbit. B. Photomicrograph of section taken from this lesion. C. Result of one coagulation operation under ether anesthesia. Artificial features by the Sculpture method are very satisfactory in similar cases. (In our opinion this is the type of lesion in which the coagulation method stands supreme. No other method could be employed successfully.)



A B

FIG. 6.—A. Very advanced basal cell epithelioma, involving the tissues of the face, nose, septum, antrum, malar bone, whole orbit, ethmoid, frontal sinuses, and extended to the inner canthus of the left eye. B. Showing the result of one coagulation operation under ether anesthesia. Again as in Fig. 5 the coagulation method was particularly indicated and the same result could not have been accomplished by any other method.

between the growth and the needle, the current will be conducted to the tissue in the form of convective sparks which sometimes approach the intensity of a flame, depending upon the frequency of the oscillations in the current. Under such circumstances the coagulation will be superficial. If the active electrode remains in contact with the growth, heat will be generated in the tissues without the production of sparks. Under these conditions the tissues will be quite deeply coagulated, the actual depth depending upon the duration of the application. Better control of this can, however, be accomplished by inserting the needle into the tissues to the desired depth. Unlike the heat generated by these high-frequency currents, that produced by the actual cautery is comparatively superficial in action. The former is generated within the tissues by the resistance to the current, while the latter is merely transmitted by contact.

Whether employing the desiccation or the coagulation method, the aim should be to destroy the growth at a single operation. The diseased tissue should, as a rule, be immediately removed either by excision or curettage, which may usually be accomplished without hemorrhage. If necessary the base may then receive further treatment. When, however, mucous surfaces are involved, owing to the greater danger of secondary hemorrhage in these localities, the destroyed tissue is, with few exceptions, allowed to slowly separate. When sufficient intensity of current is employed, bone will separate within several weeks. If important blood-vessels are implicated, it is a safe procedure to ligate them preliminary to treatment.

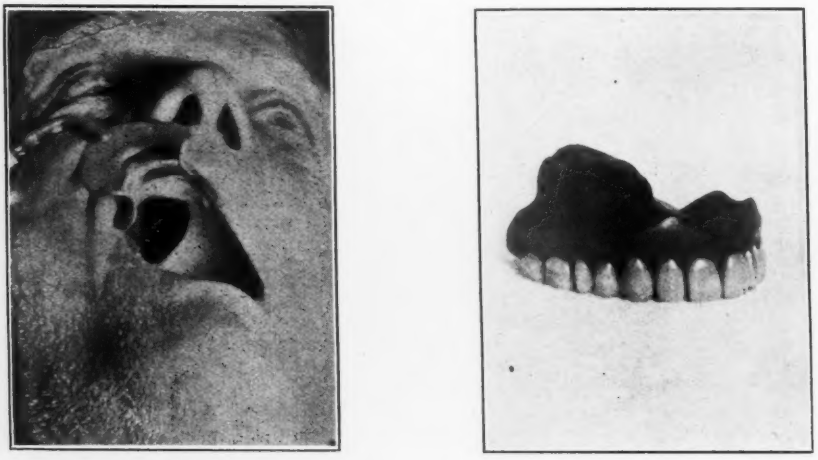
In dealing with localized, benign, or malignant lesions, the superiority of the electrothermic methods over radiation treatment is shown by definite histological changes, and by comparison of permanent clinical results. With electrothermic methods the diseased tissue only is destroyed, conserving the vitality of the surrounding normal structures. Subsequent treatments, should they be necessary, offer equally good prospects of success as though the tissues had not received previous treatments. On the other hand, with radiation treatment of sufficient intensity to influence a malignant growth, it is impossible not to lower the vitality of the surrounding normal tissue to a certain extent, and, in case of recurrence, little more can be hoped for from further radiation treatment, owing to the resulting

fibrous changes. This is a fact well known to radiologists. Owing to these resulting changes, radiation treatment should not be used in conjunction with electrothermic methods in localized, benign, or malignant lesions. There are many cases in which the

FIG. 7.—Showing the result of a coagulation operation upon a very advanced basal cell epithelioma involving the upper lip, nose, septum, antra, ethmoid, frontal sinus and left orbit.

electrothermic methods are not applicable and where radiation treatment is preferable, but our experience has been such that we feel very strongly that the electrothermic methods alone should be used in the type of lesion mentioned.

High-frequency machines, as devised by different manufacturers, vary greatly in construction; hence there is a corresponding variety in the quality of the currents produced. The thermic intensity is often too great or too little, and an undesirable faradic effect, producing shocks and contraction of the tissues, is experienced when improperly constructed machines are used. This want of standardization is unfortunate, since to produce the desiccation or coagulation effect under the best conditions a very accurate balance must be maintained between the voltage and the amperage, and also between the capacity, inductance, and the resistance. Thus, different operators, employing different types of apparatus, may obtain different results. A machine giving a satisfactory therapeutic current may not be suitable for good surgical work. We have, for example, found it necessary to have machines constructed according to definite specifications to enable us to obtain the various factors necessary for our particular requirements. However, even with a machine constructed on correct lines, the difficulty of application lies principally in the acquirement of a proper technique. Much harm can be done by an operator without practical knowledge of the various factors involved. This warning is timely, since a considerable number of cases come



A B

FIG. 8.—A. Demonstrating result frequently obtained in carcinoma of the hard palate, alveolus and antrum by the coagulation method. B. Denture, preventing food from entering antrum and assuring normal speech.

under our observation that have been improperly treated with high-frequency currents. We have also heard these methods condemned by capable surgeons who have employed them, but upon studying their technique it has been easy to comprehend

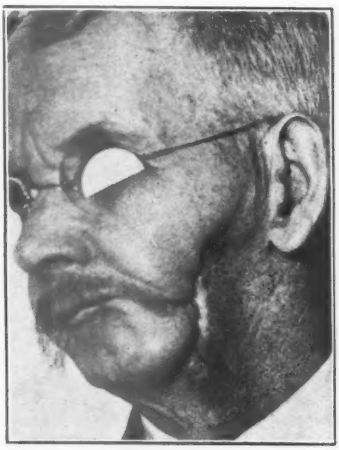


FIG. 9.—Illustrating result obtained in extensive squamous carcinoma involving the buccal surface extending through the cheek, most of the lower jaw, with metastasis to the cervical glands. The initial lesion including the bone was first coagulated, the jaw resected later. Radium needles were employed to treat the metastatic glands, with *x*-ray treatment from other portals. A year later a plastic operation was performed utilizing a flap from the chest.

the reasons for their dissatisfaction with the results obtained. One who sincerely studies these methods cannot fail to be impressed with their merits.

Electrothermic methods can be practiced best only by those who have had surgical training and experience. They are quite as surgical in practical application as operative surgery, requiring the same precise knowledge of anatomical landmarks, and the same surgical judgment, that every good operator must have. The probable reasons for the apathy that exists in regard to these methods are that surgeons do not realize their potency, and that those who use them without surgical accomplishments frequently fail in their practical application.

The efficiency of these methods is increased in some cases by the judicious combination of operative surgery, radium, and the *x*-rays. The electrothermic methods should be used alone only in localized tumors of a type which do not tend to metastasize. The basal-cell type of epithelioma occurring on cutaneous surfaces, such as the face, eyelids, etc., even though extensive, and with involvement of bone, may be so thoroughly treated by the desiccation or coagulation method that recurrences are infrequent. This conclusion has been reached from the careful observation of the results of such treatment in over three thousand cases of this type.

In localized squamous-cell epitheliomata on cutaneous surfaces, or mucous membranes, the results obtained are almost as good as in the basal-cell type. However, when the growth is no longer localized and metastasis has occurred, other methods must be used in addition. A fair measure of success is obtained even in these cases. The grading of tumors according to Broder's method gives some indication as to prognosis, and has an influence on the choice of treatment.

A B C D

FIG. 10.—A. Squamous epithelioma of tongue. B. Microscopic appearance of the tumor. C. After amputation by the coagulation method. Soft pliable cicatrix. D. Showing artificial tongue made of moist cotton, materially improving speech.

Electrothermic methods are peculiarly adapted to the treatment of localized malignant growths occurring in any part of the oral cavity. In the treatment of growths of the urinary bladder, larynx, etc., suitable endoscopes must be employed

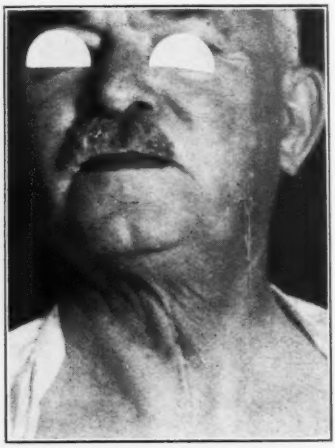


FIG. 11.—We no longer attempt to treat malignant disease of the larynx through the mouth by any method. A tracheotomy is first performed, later a laryngotomy (longitudinal slit operation); the lesion is exposed, palpated, and if localized may be desiccated. Small radium needles may be used a a supplementary measure. The above illustrates a case of carcinoma of the larynx treated this way with no recurrence in over three years. In more advanced cases a laryngectomy may be indicated, followed by radium, *x*-rays, or both.

to render the growth accessible for treatment. The choice between local or general anesthesia is governed by the same principles as in operative surgery.

As an example of an operation by the coagulation method, amputation of the tongue will be described. If the case is far advanced with considerable general emaciation, it is our practice to do a preliminary gastrostomy. This has several advantages, namely: it permits of the building up of the patient's strength, relieves the pain incident to swallowing, and frequently results in a considerable reduction of the swelling and induration in the tongue and pharynx following the rest given to those parts. The tongue can readily be coagulated through its base and then excised, with infrequent primary or secondary hemorrhage; but, to completely obviate these dangers, it is considered safer to do a preliminary ligation of the lingual, or of one or both external carotid arteries. Ether anesthesia is employed. The ether should, however, be removed from the room when the patient is fully under its influence and before applying the current, else it might ignite. Should the operation be unusually prolonged and the patient show signs of regaining consciousness, it may be temporarily discontinued as often as required, and ether again administered. As a rule, however, this operation is of such short duration that the use of ether a second time is not necessary. Scopolamine, gr. 1/100, and morphine, gr. ¼, may be in some instances used hypodermically one hour before the administration of ether. Less ether will be necessary under such conditions and the immediate postoperative discomfort minimized.

After separating the jaws with a mouth-gag a heavy silk suture is passed from side to side through the tip of the tongue, by means of which it is drawn well forward. The coagulation needle is then brought in contact with the anterior surface of the

FIG. 12.—Illustrating a type of carcinoma of the breast in which the coagulation method is indicated.

tongue as far back as is necessary, and the current turned on either by the operator, or by means of a foot control, or by an assistant, on signal. The needle is then moved across the tongue and carefully inserted into it at different points, allowing

coagulation to take place as it moves. This having been thoroughly accomplished, the tip of the tongue is elevated by means of the suture and a straight, sharp sewing needle, of proper length, is substituted for the curved knitting needle previously used. The frenum is then coagulated and the needle inserted between the tongue and the floor of the mouth. When coagulation is

FIG. 13.—Squamous carcinoma of the clitoris and labia. The desiccation method is indicated to treat lesions of this type, supplemented by *x*-ray therapy to the inguinal region and pelvis.

again completed, curved scissors may be used to cut through the coagulated areas on both surfaces of the tongue then separated from its attachments. After-treatment consists of simple antiseptic mouth-washes and the application, two or three times daily, of Dakin's solution, or one of its modifications, which sterilizes, deodorizes, and tends to keep the slough firm and free from maceration. Care should be taken not to remove the slough prematurely, else secondary hemorrhage may occur. When a preliminary ligation has been performed this, of course, is not so much to be feared. Such a major electrothermic operation should be performed in a well-appointed operating room, using the same preparatory technique as in any surgical operation.

In addition to the desiccation or coagulation of the affected tissues, and the sealing of blood and lymph channels, the heat penetrates beyond the area totally destroyed and devitalizes malignant cells, without permanently impairing the healthy tissues, thus lessening the likelihood of local recurrence, or metastasis, and conserving the maximum amount of normal tissue. It is a demonstrated fact that malignant cells, especially those that are least differentiated, are more vulnerable to heat, and are devitalized at a lower degree of heat than are normal cells. This thermic sensitiveness to the action of the high-frequency current has often been observed clinically and demonstrated histologically.

The success obtained in the treatment of malignant disease by the desiccation and coagulation methods is explained by the fact that all malignant tissue is, when possible, destroyed with one radical treatment. The practice of intentionally treating a malignant lesion by a series of desiccation or coagulation operations is reprehensible

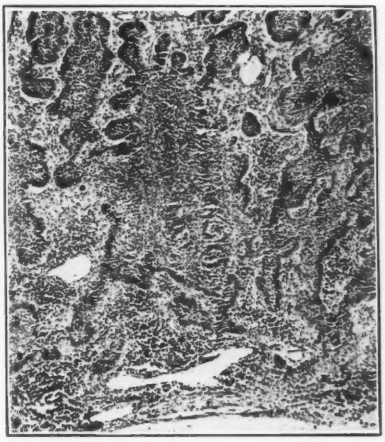


FIG. 14.—Section of basal cell epithelioma removed before the application of the desiccation current, showing bulky masses of infiltrating basal cells.

and must be discouraged. It is quite as irrational as to expect success by surgically excising a cancerous growth in a series of operations.

*Histopathological Studies.*—In the vast majority of instances histological studies of neoplasms are limited to diagnosis. Since the advent of radium and *x*-rays, not a little attention has been given to the microscopic changes in the tumor tissue submitted to

the action of these agents, namely, the hydropic and fatty metamorphosis of the cytoplasm, the pycnotic nuclei, the round-cell infiltration, and the vascular and fibro-

FIG. 15.—Section from same growth as Fig. 14, showing the effect of the desiccation treatment. The cellular masses are definitely shrunken. the individual cells shrivelled, and the nuclei condensed and elongated.

blastic changes. As far as we know, no studies have been made of histologic changes in neoplasms following the use of the desiccation method, first described by

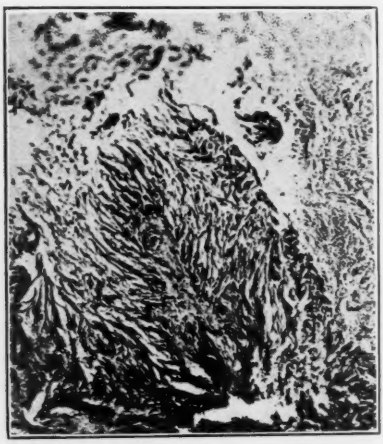


FIG. 16.—Basal cell epithelioma, showing the characteristic appearance of the affected tumor elements. The cells appear as long-drawn-out slender threads, the whole presenting a mummified appearance. (Mummification necrosis)

one of us (Dr. W. L. Clark), and that of coagulation, originated by Doyen. During our usual routine of examining tumor tissues for diagnostic purposes, the peculiar appearance of the cells submitted to desiccation and coagulation was observed to be entirely unlike those treated with radium and *x*-rays. This led us to further investigation.

Clinically summarized, the aim of the electrothermic methods is to destroy malignant cells, to seal blood-vessels, and obtain a healing wound with the least amount of cicatrization.

In order to correlate the histologic findings with the clinical results obtained, microscopic examination of tissues exposed to desiccation and coagulation currents

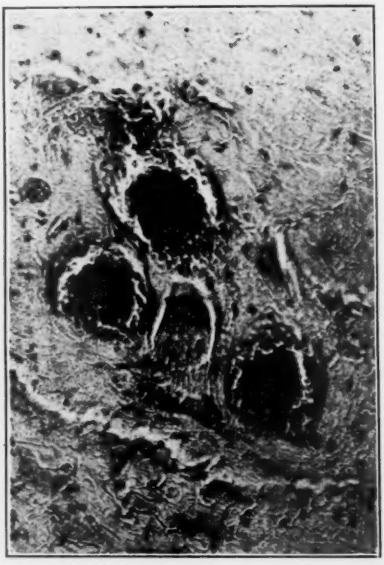


FIG. 17.—Squamous cell epithelioma treated by the coagulation method, showing the microscopic appearance of an extensive area resembling hyalinization, and several sharply defined thrombosed vessels. The tumor cells seem to have fused into a structureless homogeneous mass.

was undertaken. The material used consisted chiefly of epitheliomata (basal and squamous type), and the normal tissues of laboratory animals. The investigation entailed the study of the effect of the current on the cells and blood-vessels in the immediate and remote areas of the fields of operation. The histologic pictures thus obtained were so well defined and uniform as to stamp them with definite characteristics. The cells submitted to the

desiccation current were shrunken and shriveled, and their nuclei condensed and elongated, the whole assuming a mummified appearance (mummification necrosis). Some of the blood-vessels were thrombosed, the walls remaining intact, and there were no evidences of external hemorrhage. In the case of coagulation, cell outline was entirely lost, the affected tissue elements seeming to have fused into a structureless homogenous mass presenting an appearance not unlike that of hyalinization. The majority of the neighboring blood-vessels were thrombosed.

Since the neoplastic tissues examined were those obtained at the operating table, no opportunity was afforded to observe if any cell reaction had occurred in the zone of irritation adjacent to the area treated. For this purpose guinea-pigs and rabbits were used. Small areas of skin, subcutaneous tissue, and muscle were submitted to desiccation or coagulation currents and the animals returned to their cages. Several days later sections of these areas were removed for study. They revealed practically the same tissue changes already noted, but, in addition, round-cell infiltration was observed in the outlying zones, and in certain of the microscopic fields this infiltration was localized around the blood-vessels.

How may one interpret these histological findings in terms of clinical values? In other words, what are their practical applications?

While it is outside the province of this paper to enter into a discussion of general pathology, it is deemed essential to call attention to a few fundamental pathologic principles in order to better correlate these histopathologic and clinical aspects of the electrothermic methods.

In general, degeneration and necrosis are caused by irritants. An irritant is any agent, or factor, capable of causing a biochemical upset, and is responsible for the histologic changes in the tissues. A degenerative process once initiated, and persisted in, leads to cell necrosis. The necrotic material eventually disappears, and the destroyed cells are replaced by connective tissue. The amount and quality of this connective tissue is in proportion to the amount and nature of the degenerative and necrotic material which it replaces. Irritants resemble each other in that they induce degeneration, necrosis, and cell infiltration. They differ from each other in the form of degeneration and necrosis, and in the type of cell reaction. Whether the degenerative process shall be fatty, hyaline, or amyloid, or the infiltrating cell be a polymorphonuclear, lymphocyte, endothelial, or eosinophile, etc., or whether the fibroblastic proliferation be diffuse or localized, is determined largely by the type of irritant and its mode of action. Hence the multiplicity of the various histopathologic phenomena. These, together with the associated secondary changes, give the histologic picture its specific character.

Viewed in the light of general pathology, typhoid, tubercular, luetic, and diphtheritic lesions present the same basic tissue changes, namely, necrosis and cell reaction, the difference being in the types of degeneration, of necrosis, and of cell reaction. Their distribution and particular localization endow these lesions with specific characteristics.

The secondary and associated changes of all lesions are regeneration and fibrosis. Whether the fibrous connective tissue shall be abundant and dense, or less abundant and soft, depends upon the amount and nature of the associated degenerative necrotic materials, which, in turn, is determined by the particular type of irritant. For example, compare the cheesy necrosis of a tubercle, the necrotic material of a gumma, and the pseudomembrane of diphtheria with their respective associated fibrosis.

The relationship between the type of irritant and the tissue changes induced is so intimate and constant that, given a particular histologic picture, the causative irritant is at once evident. The above mentioned lesions are good examples. Briefly stated, indicate the type of irritant, and the type of lesion can be described. Conversely, give the histology of the lesion, and the nature of the irritant will be revealed.

It is these fundamental principles of pathology upon which the microscopic studies were based, and it is in this sense that the tissues treated by electrothermic methods present histologic pictures which are of such uniformity and constancy as to endow then with specific histological characteristics, namely, the shrunken and elongated appearance of the cells and their nuclei, and the round-cell infiltration in the case of desiccation; and the complete loss of cell outline and hyalinized appearance of the tissue, and the thrombosis of blood-vessels, in the case of coagulation.

The electrothermic methods are dependent for their results upon the resistance of the tissues to the current, which manifests itself in the formation of heat.

In the case of desiccation, the current being of comparatively low amperage, only a moderate degree of heat is produced, of sufficient intensity, however, to cause complete evaporation of the water content of the cells, hence their mummified appearance. Since the mode of cell death is associated with very little degenerative change and scant disintegrated material, there is but a small amount of fibrous tissue as an end result, hence the good cosmetic results, and, incidentally, the neighboring healthy tissues are spared the devitalization resulting from the formation of abundant contractile fibrous tissue. The coagulation method, requiring a higher amperage, induces a more intense heat, so that it not only dehydrates the tissues but causes coagulation of the cell protoplasm. This greater degree of destruction results, as we have learned to expect, in a proportionately greater amount of fibrous tissue formation.

Thus, in conclusion, not only are the aims attained, as stated at the outset of this paper, but the entire method is placed upon a histologic basis and correlated with clinical results.

2215 Walnut Street.

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# Syphilis of the Ear, Nose, and Throat[1]

BY BENJAMIN H. SHUSTER, M.D.

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If I were to take up this subject in a text-book fashion, and mention all of the known conditions in the ear, nose and throat caused by syphilis, this paper would necessarily be prolonged to an unreasonable length and would become tiresome enough to be uninteresting. I will therefore confine my remarks to a few of the more common conditions as they arise in practice.

If syphilis, as a disease, would progress as it is supposed to do—that is, to occur in its proper consecutive stages, in the usual course of time, with its concomitant manifestations, and its lesions remain syphilitic in character—things would not be difficult. As it stands, however, it often fails to abide by its prescribed rules, and assumes aspects very confusing.

There are some characteristics about syphilis that remain constant, and if hidden do not stay concealed very long. I have in mind its insidious onset, the typical round-cell infiltration, the rapid glandular involvement, its swift destruction of tissues once it becomes established, and its typical scar-tissue formation.

As far as the manifestations in the nose and throat are concerned, it apparently disregards its chronological sequences, or I would probably be more correct in saying that it does follow its course but in a way that the patient is not aware of. It is not uncommon to find that the secondary or tertiary lesions are found in the throat or nose without the patient ever recalling having had any earlier lesions.

As to syphilis of the nose, I have seen patients with spicules of bone perforating

[1]Read before the Southeast Branch of the Philadelphia County Medical Society.

into the nasal cavity or downward through the hard palate into the oral cavity without any discomfort to them other than the sensation of having a foreign body in the nose or palate. One patient could not recall having been sick enough to employ the services of a physician at any time, yet the disease must have taken its course throughout its stages. Perforation of the bony septum with ozena is frequently found, this being a typical syphilitic manifestation. Tuberculosis also causes perforation of the septum, but this is always in the cartilaginous portion and is thus distinguished from syphilis. Gummatous infiltration is often met with in the septum. The characteristic saddle-back deformity and falling of the alæ nasi are conditions resulting from destruction of the inner bony support of the nose. Secondary lesions may also occur in the nose in the form of rhinitis, swelling, and secretion from the nose subacute in character. This is not characteristic, however, with the exception of snuffles in the infant. Chancres have been reported to occur about the alæ nasi as a result of infection with the finger.

In the oropharynx there are conditions which can definitely be recognized as syphilitic without difficulty. One is the well-known mucous patches distributed throughout the oral cavity. Their symmetrical arrangement, area of infiltration around a superficial ulceration with well-defined margins, absence of noticeable pain or annoyance, distinguish them from other simple ulcerations found in the mucous membrane of the mouth. In the soft palate and pharynx large scar formations and perforations in the soft palate are almost always evidence of previous syphilitic ulcerations. In one case, however, in the dispensary of the Pennsylvania Hospital my attention was once called by my chief, Dr. Coates, to a woman who had an ugly scar on one of the anterior pillars which she claimed to have had since childhood, and which was the result of a smallpox lesion; but cases like this are exceedingly rare. Ulcerations on the posterior part of the palate often cause adhesions to the posterior pharyngeal wall and cause almost complete nasal obstruction.

When we come to the region of the tonsil we meet with a number of conditions which at first glance look very much alike and must be carefully distinguished from each other. Chancre of the tonsil is not uncommon. Infected dishes and perverted sexual practices are the chief etiological factors. Cases have been traced to unclean surgical instruments during some operation, like incising a peritonsillar abscess. Vincent's angina simulates chancre, and so does tuberculous ulceration and a breaking-down secondary syphilide. In older persons carcinoma has to be contended with. Vincent's angina should at once be recognized by a smear from the lesion in which the characteristic organisms may be found. In the other conditions the typical infiltration, well-defined edges, punched-out appearance of the wound and the small amount of discomfort produced by even extensive lesions point to syphilis. A history of infection is not always obtainable, the Wassermann reaction sometimes fails us, and when the lesion is not very typical we have to depend upon a therapeutic reaction. I recall one case of a typical follicular tonsillitis which lasted for over three weeks, smears negative for Vincent's angina, Wassermann negative, and which caused considerable discomfort at night. This case was under the care of a friend of mine. He suspected syphilis because of a blanched appearance of the tonsil; it looked like an ulcer underneath a piece of tissue paper. Antisyphilitic treatment cleared the condition up almost over night.

More than once I have seen the error committed, and once in my own experience, of opening a gumma or syphilitic infiltration in the tonsil which was mistaken for a peritonsillar abscess. I always hesitate to open a peritonsillar abscess in a young adult in the absence of constitutional symptoms and much pain. Yet the chance must sometimes be taken, and of course no harm is done. The presence of severe pain, however, nearly always eliminates the luetic condition. In older persons carcinoma has

to be reckoned with. In carcinoma, when it breaks down there is considerable pain and the ulceration is not clean-cut but rather irregular in appearance. I feel where there is a doubt we should not fail to give the patient the benefit of a therapeutic test. This was once forcibly brought home to me in a case of supposed tuberculosis of the larynx. Everything in the case pointed to tuberculosis—chest signs, *x*-ray findings, negative Wassermann. The only thing that was not found was the tubercle bacillus in the sputum. The ulcerations in the larynx were tuberculous in appearance and location. The usual local treatments like electrocautery and local applications were given without any perceptible improvement. One day the patient was seen and the usual treatment was administered, and he was told to come back two days later. When he did come back and an examination of his throat was made, a new and very large ulceration was found extending upward along the side of the pharynx. This was too rapid for tuberculosis. A dose of salvarsan was decided upon and given, with marked improvement. The ulcerations disappeared after two or three injections. The Wassermann test was positive.

I later found that the patient was a veteran of the World War and was once gassed. I was also informed by friends in the Veterans' Bureau that it is quite common to find typical tuberculous lesions in the chest upon physical and *x*-ray examination in individuals who had been gassed, although tubercle bacilli are not found, and that they are not considered tuberculous.

Another condition in the larynx that may be seen and recognized as syphilitic is a web formation between the cords, a fibrous layer of tissue bridging over between the cords. This is a manifestation of luetic scar-tissue formation. Stenosis of the larynx as a result of such scar tissue is a troublesome condition.

As far as the relation of syphilis to the ear is concerned, we may dismiss the external and middle ear briefly. In the external ear nothing more characteristic than in other parts of the skin is to be found. In the middle ear its manifestations are not seen frequently enough to be considered an important factor. Its occurrence has been reported by various observers. It is conceivable that a chancre or syphilitic ulceration in the nasopharynx may extend to the middle ear through the Eustachian tube, causing a purulent otitis media, and even extend further outward in the form of an ulceration through the ear drum to the external canal. Such cases have been reported but are not frequent. In my comparatively limited experience I have had occasion to examine what might be considered a fairly large number of ears normal and diseased, but I have not as yet seen a case of otitis media which could definitely be pointed out as syphilitic in character. Many cases of purulent otitis media may have had a syphilitic origin, but there was nothing about them which would attract attention to this fact. I have seen postoperative mastoid wounds, which healed very sluggishly, respond rapidly to mercurial inunctions.

The internal ear is another problem. In it syphilis is frequently encountered. It occurs as a sudden oncoming and profound deafness and tinnitus during the course of other syphilitic manifestations; or it may have a gradual onset and appear in the late stages of the disease. It may be the only manifestation of syphilitic character that the patient has ever been aware of. The diagnosis is made from the fact that it is a nerve deafness; that is, in testing with the tuning-forks we find diminished bone conduction and loss of hearing to high pitch sounds in a young or middle-aged individual, and there being no other cause to explain it. The other most likely cause would be an occupational one like boilermakers or others who work in noisy places.

Recently Fisher and Jones and their coworkers in their detailed study and application of the Barany tests have pointed out another method of detecting the eighth nerve impairment which is a frequent result of syphilis. And while, in their enthusiasm, they evince a marked degree of overconfidence in their conclusions, their findings together with other signs of an impaired cochlea are certainly worthy of serious con-

sideration. Their findings alone should be looked upon with suspicion. They often base their diagnosis of syphilis of the eighth nerve on a few seconds of diminished nystagmus after turning, sometimes this sign combined with a few seconds of diminished vertigo after turning. If I were to label such individuals with syphilis I would surely have to do it to a large number of them. At first I thought that there might be something wrong with my technique, but I tried to follow instructions to the letter and with similar results. In the presence of known syphilis or other corroborative syphilitic manifestations their findings are very significant, and may often be of value in indicating the progress or retrogression of the disease.

Before closing I wish to say a few words about the treatment of syphilis in ear diseases. There is still a controversy amongst otologists of authority as to whether arsenical preparations are of value. Some go so far as to say that they are harmful, because they leave the eighth nerve in a worse state than before. Those favoring the arsenicals claim that this state of affairs is only apparent because the usual doses of the drug employed are too small to have any effect on the nerve. I have always hesitated to employ the salvarsans in internal ear conditions and have resorted to the so-called mixed treatment. One young woman I treated, with apparent improvement in hearing, with mercury, the patient stating that she could finally hear sounds on the telephone, something she could not do previously. Something prompted me to administer a dose of salvarsan, and in a few days the patient returned with the complaint that she was worse than ever, and she appeared not to have made any further progress. I have never tried it since.

In conclusion I wish to call your attention to what I think is the most important thing about syphilis in the ear, nose, and throat. I refer to the fact that it is frequently found in these parts when there is no other evidence of disease. It is evident therefrom that the examination of these parts and the recognition of the conditions in them possess an important diagnostic value. These parts can be utilized as a window through which to look into the general system, because it need hardly be said that in spite of the absence of other evidence of syphilis the manifestations in the above named organs are nothing but the expressions of what lies underneath.

1717 Pine Street.

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# The Therapeutic Use of Digitalis Leaves

BY LOUIS FAUGERES BISHOP, A.M., M.D., Sc.D., F.A.C.P.

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From time to time some clinican will declare his preference for digitalis leaves as being the most available and safest of all forms of the drug. For a long time my own habit has been to keep on hand for the use of my patients freshly prepared compressed tablets containing half a grain of digitalis leaves. This simple preparation has attained such a reputation that every little while some one will beg them of me to send to some physician at a distance who is treating a friend or relative with digitalis. Curiously enough I get reports that these have succeeded where other preparations have failed. I suppose the point is, that having abundant opportunity at all times to test my digitalis clinically in the actual treatment of heart patients, I am certain that it is working well.

The general consensus of opinion is that the best test of the therapeutic value of a digitalis preparation is in its use in hearts that need the remedy, particularly auricular fibrillation. The best plan for a physician who has occasion to use digitalis, and wishes to use the leaves, is to arrange with

his own druggist to make half-grain tablets from freshly powdered leaves once in a month or two and supply them to him.

Manufacturing pharmacists do not, as a rule, sell the powdered leaves in tablet form, and most druggists are now supplied with tablet-making machinery. The next best thing that the physician can do is to select a preparation of some reliable manufacturing pharmacist and stick to it.

The powdered leaves given by mouth are much safer than preparations given by other methods, particularly if given in frequent, divided doses. One need not fear the local effect on the stomach, for that very seldom happens in actual practice. The nausea and vomiting in very sick people with delicate stomachs is from other causes, and digitalis can be given until the dose has reached nearly to the saturation point before nausea from it appears.

A few years ago a man doing consulting work in cardiology frequently met with examples of heart trouble that were not relieved because of the insufficiency of dosage of digitalis. This still is true in a measure, and the consultant is able to achieve a brilliant cure by the suggestion of adequate doses. But of late there has come about a reverse condition, and the consultant finds in certain instances that digitalis has been excessively used and that the person is in jeopardy for that reason.

If a man is accustomed to using some preparation, supplied in tablet form, particularly one of the tablets containing several substances, and suddenly shifts to one of the newer proprietary preparations which actually represent a grain and a half of the drug, and if he orders this dose to be given every three hours, trouble is sure to follow. If the preparation is given by mouth the chances are that the patient will suffer nausea and save himself. If it is given hypodermically nothing can save him, if such dosage is continued very long. The first effect will be complete anorexia, prostration, the pulse becoming rapid and weak, and the patient will show all the symptoms of shock. If he survives an intractable nausea may follow.

Symptoms of digitalis poisoning are not easily recognized in a very sick person, and it is important to know just how much of the drug is being taken. It is very illogical to use any proprietary preparation, the digitalis content of which is not definitely known. There is greater danger of poisoning in people without heart disease. The diseased heart has a tolerance for digitalis that is not often found in the normal organ.

It is necessary to repeat often and emphatically the fact that digitalis does not slow the normal heart, and that it is extremely dangerous for any one giving large doses of the drug to expect to be warned by slowing of the pulse.

The appearance of extrasystoles or so-called skipped beats indicates irritability of the ventricle which may run into ventricular tachycardia. This is far removed from slowing of the pulse that some men still look for from digitalis. Digitalis may of course show itself in true coupled rhythm and there may be suppression of urine.

However, when all is said, the main point to remember is that death may result from the administration of excessive doses of digitalis, particularly when given hypodermically to sick people whose hearts are not healthy.

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## Roentgen-ray Therapy in the Treatment of Exophthalmic Goitre.

Goodwin and Long, in the *American Journal of the Medical Sciences* for January, 1924, include nine cases of toxic exophthalmic goitre treated with the Roentgen-ray. In five of these cases the results of treatment have been satisfactory. In one case the influence of treatment is doubtful, and in another no conclusion can be drawn because treatment was interrupted. In the two remaining cases the toxemia seemed to increase in spite of prolonged treatment. In the five favorable cases they are unable as yet to speak of the permanency of benefit or tendency to recurrence of symptoms.

# Editorial

## SOME POINTS AS TO THE TREATMENT OF SYPHILIS.

It has long been recognized that in the treatment of syphilis the body itself is a most important factor in achieving the results desired. Infection occurring in an individual who is devitalized, from one cause or another, is usually more virulent than it is in one who is in perfect health at the time of inoculation. One of the reasons why patients suffering from this disease often improve more rapidly in a health resort under treatment than they do at home is that all their energies are devoted to the combat instead of being for the most part employed in their ordinary pursuits.

Another phase of this matter deals with the question as to whether in ordinary cases of infection there is not on the part of the body a gradual immunity developed similar in nature to that which we now know exists in infection with tuberculosis. As is well known, a very great number of human beings are infected by the latter disease at some period in their life, but subsequent to infection they develop an immunity which protects them more or less, and sometimes quite completely, from another infection. Evidence is accumulating continually that a similar proposition holds true in regard to syphilis, and it has been thought by some that the latency of syphilitic manifestations after the middle of the secondary stage is an evidence that such a process is taking place in the body. Certain it is, that in some cases of infection in which the virus is unusually virulent and the patient unusually susceptible, these latent periods are comparatively rarely met with.

During this period of rest or quiescence, it has been found that reinoculation does not occur, whereas prior to this a second inoculation is not impossible. Indeed it would appear that natural immunity is more effective in preventing a second inoculation than is the treatment by antisyphilitic remedies, since patients so treated seem to be more frequently subject to such an accident than those who have not been treated.

In this connection it is important to emphasize the fact that very vigorous treatment should be carried out at the earliest possible moment and continued over a long period of time. By this means artificial resistance to the disease may be instituted, whereas slipshod treatment may fail to counteract the infection by arsenical compounds and delay the development of a certain degree of natural immunity. In other words, we not only have the obvious reason for pushing treatment actively as early as possible, but there is a second factor emphasizing this point, which has heretofore not been given sufficient consideration, or again, to put it differently, a half-hearted line of treatment may be actually harmful not only for the reason just given, but in addition because an immune strain of spirochetes may be developed which it will be most difficult to overcome by any safe dose of arsphenamine.

Another point to be borne in mind is that experimental evidence at the present time indicates that wide-spread infection occurs at a much earlier date than some persons have heretofore thought likely. The present thought seems to be, that inoculation having taken place, the dissemination of the spirochetes throughout the body takes place almost at once, that is, within a day or two, and that the general infection does not wait until the telltale initial lesion develops.

Finally, in regard to this point as to the necessity of most vigorous treatment in the earliest possible stages of the disease, it is not to be forgotten that after some weeks or months have elapsed the spirochetes are able to embed themselves in tissues where they are very largely protected from the arsenical compound in sufficient strength to

destroy them, but not in sufficient strength to prevent the development of immunity.

Without any intention of expressing a pessimistic therapeutic view in regard to the efficiency of arsphenamine, it would appear, as additional facts accumulate, that it is a grave question in many cases whether it is possible to consider that a patient once infected is actually cured, in the sense that all infection is eradicated. Warthin has emphasized this point very strongly as a result of his pathological investigations, pointing out that in many instances in which the patient has been thought to be cured, careful examination of the tissues post mortem nevertheless shows the presence of the parasites in a quiescent or a semiquiescent state.

Some time since we published in our Progress columns an article which detailed the use of arsphenamine as a prophylactic to be employed after a suspected exposure. Further clinical results would seem to indicate that this is not efficient, because while it may prevent the development of a chancre and so lead the physician and patient to the belief that inoculation has not taken place, such a condition has actually occurred and treatment is delayed, when, had the initial lesion developed, the great need of active treatment would have been manifest.

Last of all, it is becoming more and more evident that mercury, while far slower in producing its effects than arsphenamine, has by no means lost its value in the treatment of this disease, and, indeed, may be said to equal or even surpass arsphenamine in usefulness.

In other words, every specific case, unless there is some definite contraindication to it, should receive at weekly intervals a full dose of arsphenamine, or neoarsphenamine, intravenously, and at the end of this period a course of hypodermic or intramuscular injections of some active mercurial. It has been our custom to employ for this purpose ampoules of biniodide of mercury dissolved in physiological salt solution one per cent every other day for twelve doses and then to revert again to another course of arsphenamine, impressing upon the patient that this does not complete the treatment, but that it should be repeated at frequent intervals for not less than a year's time, and that this should be done even if an examination of the blood by means of the Wassermann test proves negative. Indeed it may be said that treatment should be persisted in even if the cerebrospinal fluid as well as the blood produces a negative report. A recognition of the fact that we cannot be sure at present that any method will completely eradicate the infection, emphasizes the importance of masterly activity and persistence. It would appear at the present day that the most that we can promise is the submersion of the infection to such a degree that the patient may remain without symptoms, and after that time, of course, partly by natural processes, be unable to transmit the infection. Certain it is that the hope of Ehrlich, expressed when arspehnamine was introduced, that in these arsenicals we were provided with an absolute cure, has been dashed on the rocks of disappointment.

## DIGITALIS LEAVES VS. GALENICAL PREPARATIONS.

For many years there has existed a demand on the part of the medical profession for preparations of digitalis which might be used hypodermically. This demand has arisen from the fact that digitalis is recognized as a powerful cardiac stimulant or supportant and, therefore, is turned to to meet emergencies in practice. Several facts, however, have been overlooked. One is that digitalis is a drug which produces its influence upon the heart with great slowness, whether it be given hypodermically or by the stomach, and, therefore, is quite unsuitable to meet emergencies of an acute character. The second is that the peculiar constitution of its active principles makes it very difficult to prepare a product which will truly represent all the therapeutic virtues of digitalis leaves. The result is that there is

much divergence of opinion as to the best preparations to be employed by the needle, and also much difference of opinion as to the proper dose when administered by this method.

Thirdly, most of the preparations provided for hypodermic administration are sufficiently irritating to be painful at the moment of injection and to cause some discomfort for some hours after their use. It, therefore, may be said that the only justification for the use of digitalis by means of the hypodermic needle is the existence of some condition of the stomach which leads the physician to believe that its absorption will be exceedingly slow or not take place at all.

In this issue of the GAZETTE we publish an article by Dr. Bishop upon the use of tablet triturates of digitalis leaves. Such a method we believe to be excellent, provided that these leaves have been subjected to the physiological tests which fluid extracts and tinctures of digitalis represent. Personally, we have always found that such tablets may be well replaced by those representing five minims of the tincture as they retain their activity for a long period of time and besides are less irritating to the stomach than the leaves themselves. They are more easily carried than fluid preparations.

We are inclined to disagree with the author in his statement that digitalis does not slow the normal heart, and that this slowing cannot be used as indicative of the fact that full doses of digitalis are taking effect. Naturally such doses are not commonly administered to persons who have normal hearts except for tonic treatment, so that opportunities for observation are not very common.

The main point of Dr. Bishop's paper, namely, that the physician should be sure of the activity of the product which he is employing, is to be emphasized, and again, the practice which has now become too common of using massive doses instead of moderate ones should be condemned except in special instances when they are obviously indicated.

## THE INFLUENCE OF THE X-RAYS UPON THE INTESTINAL MUCOSA.

A condition which has given rise to a great deal of speculation in the minds of surgeons and physicians has been the rapidity with which evidence of intoxication and grave illness succeed the onset of intestinal obstruction. One would suppose, in view of the comparatively mild symptoms that result from fecal impaction, that obstruction of the bowel might last for days without the development of any peculiar symptoms, but as we all know, this is quite contrary to the fact.

It has generally been considered that some toxic agent is absorbed or produced in the intestinal wall which speedily produces the grave symptoms to which we have referred, and numerous experiments in which intestinal obstruction has been induced in the lower animals, while throwing some light upon this subject, have not completely elucidated it.

Certain investigations which have recently been reported in the *Journal of Experimental Medicine* perhaps have some bearing upon this important matter. In all of these the influence of the *x*-rays in producing what might be called intestinal intoxication was carefully studied. In the first research, Warren and Whipple, recognizing that the epithelium of the intestinal tract is supposed to be an important barrier which protects underlying tissues, show quite clearly that this barrier may be wiped away completely and yet the expected overwhelming intoxication does not ensue. In other words, their researches show that when such a deleterious effect is produced upon the intestinal mucosa there is a line of secondary defense which prevents such destruction from inducing disastrous consequences.

That the free use of the *x*-rays over the abdominal surface is to be regarded as a factor possessing great power not only affecting the superficial tissues, but the intestines as well, is a point worthy of recollection.

The same investigators emphasize this point still more emphatically in a second research, which they report in the same issue of this journal, and believe that the reaction of the intestinal epithelium is similar to the reaction of deep-lying tumor tissues exposed to the *x*-rays for therapeutic purposes. This is the more important because they have found that these lesions, even more than the skin burns, do not heal and may, many weeks later, result in perforation. Indeed such a result is so frequently met with that the suggestion is made that the *x*-rays may be employed for the purpose of producing experimentally gastric or duodenal ulcer with the hope of learning more concerning these important lesions, and they therefore assert that where abdominal or pelvic radiation is being used, injury to the intestinal epithelium is always serious and in some cases irreparable unless the greatest possible care in dosage is employed.

Aside from the importance of this observation, we may point out that as such destruction of the intestinal mucous membrane does not seem to result in the prompt development of symptoms similar to those which develop in intestinal obstruction, we must look further afield for the port of entry of the toxic or other substances which so promptly jeopardize the patient's life when intestinal obstruction develops from any one of its common causes.

## THE EFFECTS OF BLEEDING IN RUPTURED CARDIAC COMPENSATION.

From time to time the advances which are being made in physiological chemistry, or in other departments of medical science, serve to place upon a rational basis measures which have been resorted to by the profession for purely empirical reasons for many years. Thus, at one time it was generally taught that alcohol was a circulatory stimulant; then when it was shown that it did not act as a circulatory stimulant, there were those who jumped to the conclusion that the observation of bedside clinicians, which resulted in a belief that alcohol was a valuable drug under certain circumstances, was an error. As a matter of fact the observation that alcohol produced improvement was correct although the conception that it did so by acting as a stimulant was erroneous, the benefit that accrued being due to the rapid oxidation of the alcohol in the body whereby energy was provided, and also by the fact that this drug by restoring circulatory equilibrium, or equalizing the circulation, acted advantageously when properly used.

A remedial measure as old, or older than the use of alcohol as a drug, has been the practice of venesection. It is true that in the early part of the last century and the latter part of the century preceding, venesection was greatly abused, but it is an interesting fact that during the past two decades it has become much more popular, it being employed more rationally in cases in which it is really indicated. One of the most striking results from the use of bleeding is to be met with when it is employed for the purpose of giving relief to persons who are suffering from the acute manifestations of ruptured compensation with marked venous stasis. It has generally been supposed that the relief achieved depended entirely upon mechanical causes, or, to put it differently, that the abstraction of blood from a vein relieved venous congestion and pressure. On the other hand, every one who has had experience knows that in some cases improvement takes place before very much blood has escaped. Considerable doubt has remained in the minds of accurate observers as to whether all the improvement was due to a mere relief of pressure.

In a recent issue of the *Journal of Laboratory and Clinical Medicine,* Grant has published an interesting contribution upon the oxygen content of the arterial and venous blood before and after therapeutic venipuncture. The patients numbered seven and suffered from acute decompensation. Careful laboratory technique, which it is not necessary to describe, was used in the obtaining of the blood, and it would appear from Grant's investigations that when there

is engorgement of the venous channels of the body, which, in other words, means a slow rate of flow through the capillaries, each unit of blood must give up a larger portion of its oxygen than it does in normal conditions in order that the tissues may be adequately supplied. It has been shown by other investigators that it is this free parting with its oxygen which results in the production of cyanosis.

The view may therefore be expressed that when bleeding is resorted to and stasis is relieved, the blood passes through the capillaries more rapidly, and therefore each unit of blood is not required to give up as much oxygen as before, and as each unit reaches the lungs it can be reoxygenated in a shorter space of time than when the circulation is sluggish.

Grant's experiments show that this view is correct, as after bleeding each unit of blood does give up less oxygen in a given time. When pulmonary stasis is marked the mechanical relief afforded to the right side of the heart is also a factor in that it sends the blood which comes from the venous system more freely through the lungs.

In other words, venesection in the conditions which we have referred to, long recognized as a valuable measure from the empirical standpoint, has been shown to possess a more scientific basis for its existence than it has heretofore been thought to have, and bedside observation is once more confirmed by accurate clinical investigation.

## THE DEATH OF HEROIN.

Just before the last Congress came to a close it passed a bill whereby the manufacture and importation of heroin is absolutely prohibited. This bill came before Congress as the result of a campaign which has been carried on for the protection of addicts, or those who by virtue of an unstable nervous system may become addicts. However worthy the object may be the result is, so far as addicts are concerned, practically *nil*, because it is a fact, we believe, that nearly all the heroin that is used by addicts is smuggled and does not pass through the hands of pharmacists and physicians.

From the standpoint of practitioners of medicine who have been deprived of a drug which a multitude of physicians have found of great value and which meets indications which no other drug affords, whether it be derived from opium or not, this legislation is to be regretted. In other words, in the endeavor to protect a comparatively limited number of defectives, an enormous number of worthy sick have been deprived of the best means of relief.

When it is recalled that some distinguished ophthalmic surgeons find heroin the best remedy to use after serious operations on the eye; when equally distinguished gynecologists find it the best for employment after operations which they are called upon to perform; when equally distinguished throat and nose specialists rely on it, and a host of general practitioners constantly employ it, it is at once evident that we have here another illustration of the fact that a few persons, interested in a particular line of endeavor, find it possible to have legislation enacted which militates against the best interests of the majority, medical and lay.

The question naturally arises as to how many members of the medical profession were informed that such a bill was before Congress and, therefore, had any opportunity to oppose it? It would seem to us that the time has come when physicians must protect their rights and the rights of their patients and pay more attention to legislative possibilities than they have in the past.

We understand that the Commissioner of Internal Revenue has ruled that heroin may be prescribed by regular physicians until the present supply in the United States is exhausted.

We think that these facts are of sufficient interest to justify their publication at this time.

## SOME LIGHT ON THE CANCER PROBLEM.

To the medical man, who in spite of an active practice has followed, with some care, the work of the various commissions and institutions concerning the experimental study of cancer, it would seem that little light has been thrown on the matter by such studies as to the cause of the growth and that little hope of adequate treatment is to be found as a result of such studies. This same man if he keeps widely in touch with current literature, and particularly with that bearing on the clinical applications of radiation, would see in this latter perhaps the only evidence of distinct progress in accomplishing a long arrest or a permanent cure aside from that offered by the early and free use of the knife. Coley's fluid has undoubtedly cured, and apparently permanently cured, many cases of malignant growth of such nature as would inevitably have resulted fatally and this in a short space of time but for his treatment. By and large, it has been disappointing, otherwise its use would be much wider than it is at present.

The medical man not especially interested in radium and *x*-ray and their applications doubtless discounts many of the articles coming from the pens of those who specialize with these agencies, holding, rightly, that the enthusiast—and most specialists are such or they would not be specialists—is as a rule astigmatic as to his results and is prone to start with the conclusion which he often unconsciously makes his records prove. If in spite of his attitude of skepticism the practitioner continues following, and with some thoroughness, the literature of radiation as applied to cancer, he will be more and more convinced that there is a real promise for the future based on truly extraordinary results. It is therefore timely that the *Canadian Practitioner* should devote its entire March number to cancer and particularly to radiation as applied to the cure of this malady.

Ewing, pathologist and director of the Cancer Research Hospital of New York City, than whom no specialist in the country is regarded with more confidence and respect by the profession at large, holds as the result of his close study of the matter that those tumors which are rapid in growth and provided with delicate blood-vessels are the ones which are most susceptible to radiation; and that such, even if of considerable size, disappear almost magically under this treatment. His histological examinations of such radiated tumors have shown autolyzed cells, collapsed blood-vessels, and massive necrosis from infarction. As to lymphoid tumors, these are particularly amenable to treatment—most so in their early stages, less so when there is fibrous growth and thickened vessels.

Ewing contrasts the prompt disappearance of lymphosarcoma under radiation, with absent or slight remaining scar, to the large fibrous deposit incident to treatment of Hodgkin's granuloma; this deposit by pressure constricts blood-vessels or hollow organs, seriously interfering with function, hence the need of early treatment of Hodgkin's disease before fibrosis becomes marked.

Ewing notes that all embryonal tumors exhibit a high degree of radial sensitivity, and attributes to this fact the successful results from treatment of basal cell carcinomas, many common tumors in children, embryonal carcinomas of testis and ovary, and possibly many uterine carcinomas. In contrast with this group is the group of anaplastic carcinomas derived from adult cells. Such are most of the rapidly growing round-cell carcinomas of the glandular organs. Ewing states that these tumors are comparatively radiosensitive, exhibiting as they do many mitotic nuclei. They often yield promptly to radiation, but the cures are rarely complete. Restraint of growth is not without its beneficent action. It relieves pain, prolongs life and occasionally causes the growth to disappear, and saves the surgeon from operations which he knows to be fruitless and to which he is urged by the necessity of doing something.

Life is not only prolonged, but made much more tolerable.

Hodgkin's disease, leukemia and generalized lymphosarcoma may remain well for years. Ewing expresses his astonishment at the betterment following radiation to spleen and lymph nodes in leukemic and lymphosarcomatous patients. He further states that neurosarcoma, the commonest form of sarcoma of the soft tissues, 120 cases of which have been observed in the Memorial Hospital in the last three years, with histories of one to twenty-one unsuccessful operations, is slow, painful, prolonged, and invariably recurs after surgical intervention. Persistent radiation applied for growth restraint has cured several cases and greatly retarded the progress of others. He observes that it exhibits to a marked degree the property of infiltration of the surrounding soft structures, and is distinctly radio-resistant because it possesses a low vascularity and a large amount of collagen fibrils.

As to the cellular forms of osteogenic sarcomas, radiation has rendered some of these quiescent by converting them into solid bony growths. The medullary giant-cell tumors generally subside under radiation, with restoration of bone shaft. Ewing holds that radiation has lessened the need of wide block dissections and has given added strength to the concept that the constitutional reaction of the patient is an important factor in the cure of cancer, quoting Dean to the effect that the activity of radiation reaction is proportional to the general health and blood quality of the patient.

Bearing on cancer of the uterus, Ochsner (A. J.) states that the results of *x*-ray and radium treatment have been so much better than those incident to the use of clamp and cautery in cancer of the uterus that it is only in extremely early cases that the latter is employed.

Stone, on the basis of 164 patients with Hodgkin's disease treated by radiation, summarizes his clinical experience by the statement that in 20 cases the disappearance of tumor and symptoms was complete. In 34 cases the symptoms disappeared, but regression of the tumor was incomplete, and in 69 cases neither symptoms nor tumors completely disappeared, but there was a definite improvement in the patient's condition. He states that palliation only can be expected and that there are only five living patients without lesions or appreciable symptoms; one has lived over four years, three have remained well over three years, one only six months.

Quick states that for six years radium has been used in practically all his intraoral carcinomas whether they be operable or the reverse, and his results have confirmed him in the belief that this means of treatment affords the best prognosis for his patients. His favorable cases he treated by interstitial implantation of unfiltered radium emanations in fine glass capillary tubes, supplemented wherever possible by the external application of heavily filtered radium or high-voltage *x*-rays. In more advanced cases palliation may be expected when external applications of heavily filtered radium are used. Extremely advanced cases should be treated conservatively by opium. In the case of prospective cure both sides of the neck are radiated by radium or *x*-rays. Definitely enlarged nodes are excised, this being followed by implantation of bare tube radium emanation in the wound. His results are not given.

Johnson, discussing carcinoma of the antrum, supplements surgery by radiation. In 26 cases of antral carcinoma, with one exception, the radiogram showed destruction of one or more of the antral walls, hence they may be regarded as advanced cases. In four cases there was no betterment. Six cases are under active treatment at present. There was local betterment in eight cases, but none of these were free from malignant growth. Two cases showed no sign of tumor for one year; one case for one and one-half years; one case for five years. One case remained well for seven years and then had a recurrence.

As to radiation in the treatment of mammary carcinoma, Lee states that he has

records of 10 of 54 primary inoperable cases entering the clinic prior to January 1, 1921, who are still alive, three being free from any evidence of disease; that the cases of recurrent mammary carcinoma have shown a prolongation of life. He believes postoperative radiation has proven its value against recurrence. He has had best results with platinum filtered radium combined with *x*-ray.

Healy reports on 598 cases of uterine cancer treated by radium previous to January 1, 1921. He believes in heavy intensive radiation of the entire pelvic field and expects a betterment in results with improved technique. In the case of primary advanced carcinoma of the cervix more than 9 per cent have lived three or more years, and the greater number of these (26 in all) seem to be free from evidence of active disease. Those who died were relieved of bleeding and offensive discharge.

Of the cervical cancers not in the hopeless group, but exhibiting extension beyond the cervix, 26 per cent have lived three or more years. Of the cases of early operable cancer of the cervix, with proper elimination and consideration of those who died of intercurrent diseases, more than 42 per cent were living and well for three years. Of the cases of recurrent cancer of the cervix of the 115 cases treated by the present method of embedding radium emanation and cross-firing of the pelvic structures, 20 per cent were living and apparently well. Of the cases of carcinoma of the uterine body, 19 in all, there were seven alive and well. Healy strongly urges the desirability of prophylactic radiation after operation and quotes figures to justify this belief.

Harrison reports that of 426 cases of rodent ulcer seen at the Radium Institute at Toronto the number of cures has been 371. He also reports over 75 per cent of clinical cures in the treatment of squamous-cell epithelioma, and writes with some enthusiasm of the use of radiation in the treatment of epithelioma of the lip, treatment being supplemented by Gamma radiation of the adjoining lymphatic areas. Of 142 cases 113 were clinically cured, some of these cases having been free from the disease for over ten years.

Degrais and Anselme Bellot state that 90 per cent of the operable cases of cancer of the cervix if treated by radium therapy will give results which will compare favorably with those attained by the surgeon, and without risk.

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## THE THERAPEUTIC EFFECT OF LIGHT AND MOVING AIR.

Among the changes brought about in part by the teaching of medical men, in part by the sound common sense of the average citizen, few are more pronounced than those incident to the often conscious, sometimes unconscious, appreciation of the value of moving air and of sunlight. Within the memory of many practitioners the entire population at a given season of the year, often independent of the temperature, clad itself in undergarments of flannel, or other thick fabric, and outer garments of wool. At night there was usually a Canton flannel investment, a covering of thick quilts, and closed windows.

The closed windows (and millions of them still remain closed) were incident to the fact that there was and is a popular belief to the effect that night air carries with it certain miasms which cause disease. The thick day garments were for the purpose of keeping the body warm, a chilling of the surface being held to be the root of all evil. Moreover these thick garments were assumed by every one regardless of occupation, whether indoors or out-of-doors. Also the average temperature of the living room was something between 70° and 80°, and the air was still air. In such an atmosphere the thickly clad indoor worker spent practically his entire twenty-four hours, saving that brief period needful for transit from home to the place of business and back again.

Year after year there were more windows opened at night, lighter garb was assumed during the sleeping hours, and both

summer and winter garments of such texture and material were worn that some air circulation was allowed about the skin surface and some light could penetrate.

It has been abundantly proven that providing the weather be reasonably warm absence of all clothing insures a better degree of health than does the wearing of any garment; that when this, or as near to it as the sensibilities of the population will allow, is practiced colds and trifling ailments are reduced to a minimum; and that the semi-naked person acclimated by weeks or months of practice may continue in the temperate zone well into the frost period with perfect comfort and redundant health.

How much sunlight-cures for tuberculosis are dependent upon skin ventilation has not been demonstrated, but this is certainly a factor in accomplishing betterments so striking and so many that surgery has been largely robbed of some of its labors—and perquisites.

In this relation Leonard Hill *(Proceedings of the Royal Society of Medicine,* March, 1924) calls attention to the extraordinarily beneficial effects accruing not only to tuberculous children, but to those suffering from rickets when the latter are exposed to sun and air. Moreover the reports of the open-air schools are fairly convincing, though it must be recognized that in addition to air and light the diet of these children is usually carefully supervised and they are given appropriate food in adequate quantities.

The effect of cool, or cold, air on the respiratory system is attributed, in part at least, to the increased evaporation from the mucous membranes, incident to which invading bacteria are supposed to be washed or blown away. Moreover, a lower temperature because of the need of heat creation increases basal metabolism.

Where facilities offer, and this should be in connection with all hospitals, the moving of septic patients into the open, which means the skin ventilation and light stimulation, has many times changed a gloomy or hopeless prognosis into a favorable one.

As to the light rays, the infra-red rays heat. Aside from this they do not affect living cells. Sonne is quoted to the effect that the blood in the skin capillaries may be heated to 46.5° C., and thereby its immunizing powers may be greatly increased. The author states that ultraviolet rays are lethal but do not penetrate deeply—indeed, according to Barnard not through one microbe. Hill states that though it is true infusoria kept cool in a quartz cell are killed in five minutes at eight inches distance by ultraviolet light, this agency will not kill infusoria in the aqueous fluid of a cat's eye. These short rays will not penetrate cornea and lens. The tissues may be sensitized by injection of substances such as eosin, under which circumstances the long visible rays may produce powerful effects. Thus Betz in his experiments was made extremely ill and remained for a long period sensitive to light. Pigment incident to exposure to the ultraviolet and visible rays, screens the deeper tissues from excessive light. Melanin is a derivative of the aromatic amino-acids, derived from protein, a product of cell damage. It has been observed to form in fresh preparations of epidermic cells bathed in a solution of diphenylalalanin, turns the rays into heat, and activates the sweat glands which keep the body from becoming overheated. It is generally recognized by practitioners that patients who pigment do best under the light and air treatment.

Glass keeps off very short rays. Thick garments stop all visible and ultraviolet rays. This is not the case with thin open-mesh garments. Hill states that the long rays beyond the infra-red used in wireless have no biological action. The explanation of the ultraviolet rays is to the effect that they "knock off electrons from atoms in the molecular structure of the colloidal particles in the living substances," and so alter the electrolytic charge of these particles that aggregation results.

Hill's communication evidences that the so-called sun treatment has proven successful in a variety of affections and particularly those incident to tuberculosis. Those of large experience caution against a too

extensive exposure in the beginning. They are nearly all in accord with the value of pigmentation from a prognostic standpoint. After all they give no consideration to the question of skin ventilation. It is universally recognized that light in itself has a psychic influence; it rather encourages, among other things, cheerfulness and optimism, but that the effect is not merely psychic is shown by experience with the blind. It is reported of one institution that the moving from an inadequate, ill lighted and homely structure to one of pleasant architecture and bright and cheerful interior produced such a change in the psychology and health of the inmates as excited the attention of all the attendants.

The doctrine should be preached and practiced, more light not only for the eyes, but for the whole body, and more gently moving air not only to be breathed, but for the entire skin surface.

# Progress in Therapeutics

## Medical Therapeutics

### Alcohol Injections for Neuralgia.

The *Lancet* of December 29, 1923, states that at a recent meeting of the Section of Otology of the Royal Society of Medicine, CHEATLE showed three patients who had sustained damage to the ear following the injection of absolute alcohol through the face for the cure of neuralgia. In two there was injury to the middle ear and in one to the auditory nerve. The first was a man aged seventy-one, who had severe deafness and some discharge from the left ear immediately after the injection a year previously. He did not have pain, giddiness, or tinnitus, but there was temporary paralysis of the facial nerve. The second case was that of a man aged seventy-two, who, following a similar injection two years previously, had severe deafness, tinnitus, and a slight discharge. There was no giddiness, pain, or facial paralysis. The neuralgia was cured. No doubt in this case the alcohol entered the Eustachian tube and reached the middle ear. Both these cases had a general anesthetic for the operation, and Cheatle pointed out that if it were done under local anesthesia, according to the custom of Wilfred Harris, the patient could give warning of anything wrong.

The third case was that of a woman aged twenty-two, who had complete deafness on the left side following the spirit injection under a general anesthetic nine months previously. There was also immediate giddiness and paralysis of the sixth and seventh nerves. She had been very ill in bed for five months, and her neuralgia was not cured. Subsequently, the Gasserian ganglion was removed; this cured the pain, but entailed the loss of an eye. Apparently the spirit had reached the subarachnoid space and directly injured the sixth, seventh, and eighth nerves.

In all the three cases the injection was carried out by experts.

At the same meeting Layton described a case in which the injury produced on a middle-aged man by injection of alcohol for the same purpose was much more severe. He had lost the left eye, and on the right he had corneal ulceration; he spoke in a high falsetto voice, and he was very deaf. The left side of his face was paralyzed. In all he had had ten injections, most of them in the Far East.

Scott, the president of the Section, said he had heard of such cases but had not seen any. He had used absolute alcohol for destroying the internal ear. As the spirit spread rapidly, it was necessary to use only a minimal quantity so that none was allowed to reach the middle ear. The

measure was only carried out by him in extreme necessity. Milligan said he had not much experience with these injections, but he knew of cases in which they had done irreparable damage, some in which it had been necessary to remove an eye. Relief in some cases he knew of lasted from nine to eighteen months, but others gained no relief by it at all.

The avoidance of accidents when alcohol is injected for the cure of trigeminal neuralgia deserves close attention. Pricking the Eustachian tube should be a well-known danger to those accustomed to giving such injections. Under local novocaine anesthesia the patient will always complain of a pain deeply situated in the ear if the needle reaches the Eustachian tube, and when this occurs the needle should be withdrawn about an inch and then pushed slightly forward. Novocaine probably does no permanent injury if injected into the Eustachian tube, and if the rule be scrupulously followed not to inject spirit until anesthesia results from the preliminary novocaine, no harm will come. Thus to secure safety under general anesthesia, novocaine alone should be injected in one spot only, and the patient allowed to come round sufficiently for testing the two sides of the face with a pin, while the injecting needle is left *in situ*. If the desired anesthesia is found to have resulted, then the alcohol syringe is fitted on and the injection completed, a further whiff of general anesthetic being given if thought desirable. If no anesthesia has resulted from the novocaine, then no spirit should be injected, but a fresh search made for the nerve. Usually it is unnecessary to give much further anesthetic for this.

The practice of making a rapid injection in the direction of the foramen ovale under a general anesthetic, and assuming that by doing so one has injected the third division of the trigeminal nerve, is to be rejected. The procedure is not by any means so easy that it can be done without care, but the nerve is there to be found if the operation be conducted with patience and deliberation, and there should be practically never any failure. In the third case described by Cheatle the catastrophe appears to have happened after the needle had penetrated the foramen ovale in the endeavor to inject the Gasserian ganglion under general anesthesia, the sudden injection of a quantity of alcohol into the subarachnoid space causing wide-spread and permanent paralysis of cranial nerves. Had the injection been done a few drops at a time, after letting the patient come round partially from the anesthetic, the operator would have been warned of danger by the appearance of nystagmus, vertigo, and commencing facial paresis. Then with the cessation of the injection the symptoms would almost certainly have passed off in a few minutes or an hour at most. The duration of relief from the neuralgia is considered to be better than Milligan suggests.

In an article on the technique of these injections contributed to the columns of the *Lancet* last year, Harris states that freedom from the neuralgia may practically be guaranteed for twelve months if the nerve has been properly hit, and in the majority of his cases the immunity from pain was much longer, ranging up to thirteen years in one case. Four and five years was a common period for the immunity to last in his experience. In the Gasserian injections there is no reason why permanent relief should not be expected, the anesthesia obtained being as complete as that after gasserectomy.

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### Chronic Constipation in Children.

In the *Archives of Pediatrics* for December, 1923, BERGER states that it does not seem that much need be said about diet. The diet should allow enough residue in the intestine to stimulate peristalsis, and should not be allowed to form hard, partially impacted masses, nor should the food be so bulky as to produce constant dilatation of the intestine. The foods that lend themselves to defeating this objective, such as light bread, crackers, in fact overindulgence in almost any of the foods high in

starch, should be reduced to a minimum. The "fodder foods," which will be only slightly digested and leave plenty of cellulose-like material in the intestinal tract, are to be encouraged. For this purpose, lettuce, celery, spinach, carrots, etc., as well as fresh fruits, serve admirably. Bran forms an excellent addition when required, being well taken with cereals, in soup or broth, or in the form of special breads. These have been far superior to the addition of substances like agar-agar in his experience. While cream with many children increases constipation by the formation of chemical soaps, butter is one of our best friends in these cases. Berger is not fond of olive oil, as he has never seen much good come from its use.

Seldom does he see a child that drinks enough water. This is important to prevent overdesiccation of the colonic contents. Stewed fruits or fresh fruits, according to the age of the child, and particularly prunes, are given freely in all of his cases. Canned fruits and vegetables, when used at all, should always come from glass jars. Tin has no place in preserving food for children. The citrous fruits have little value as laxatives.

His medication follows one of two procedures: First, laxatives are given in dosage over a definite course of time. For this purpose he often uses podophyllin, though many other drugs lend themselves well to this usage. The dosage, duration, and the repetition of the course must be determined by the response in each case individually. Second, in those children having a more or less marked dilatation of the colon, with corresponding slowing in emptying time, he gives pituitrin. This has shown very gratifying results. He has never given eserin, though possibly it might act equally well. Pituitrin, given by mouth, in sufficiently large dosage, does increase the tone of the intestinal musculature enough to remove the dilatation very shortly, as shown by *x*-ray, and give good function. In order to overcome its action on the lower intestinal tract, a dilatation is done every other day for three to five times. This is usually required to reduce the obstruction from this source, and open the gateway for evacuation. He disapproves of the prolonged use of the mineral oils in these children, as well as the frequent abuse of cascara, phenolphthalein, etc.

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## The Use of the Salicylates Per Rectum in Children.

Irving, in the *Archives of Pediatrics* for December, 1923, states that this method has been in use in the wards of the Post-Graduate Hospital (New York) under medical and nursing supervision, and has also been used in 266 ambulatory patients. Particular interest attaches to those ambulatory patients who are seen in the clinic on special days, but whose medical treatment is carried out in the home, and by one of the members of the family. Some nursing and social service supervision is possible under these conditions, but only to the extent of the instruction given to a group of mothers in the special clinic, or such as occurs in the ordinary follow-up visits to our patients.

One of the things Irving learned early in this study was that it was apparently safe to give a much larger dose of the salicylate than he had presumed to be possible. The dosage is still a variable one, depending upon the symptoms present, and their urgency. At one time it was thought that it would be a fair way of prescribing the amount to be used to allow one grain per body pound weight, but he has since used in certain instances, and with safety, a grainage almost three times the body weight of certain of their patients, so that at the present it is impossible to state a rule as to their dosage. The preparation used in all but a limited number of cases was synthetic sodium salicylate, and the average dose has ranged from 20 to 100 grains.

Sodium salicylate was selected because of its cheapness, its relatively high degree of solubility, the fact that it is easily and generally obtainable, its stability, and the simplicity of prescribing it. Other preparations may be used, the only requirements being that they be fairly readily soluble, and no more irritating locally.

His procedure has been to write a prescription calling for a solution of the salt with a standard number of grains per fluidrachm. In this way he lessens the amount of the material to be injected, and at the same time simplifies the mathematics of the dosage for those who are to administer the preparation. Irving has found it convenient to dispense a four-ounce mixture, each fluidounce of which contains either five or ten grains of the sodium salicylate. The directions should indicate the mixing of a certain number of fluidrachms of the prescription with an equal amount of a bland, water-soluble substance, as one of the mucilages, or a more common household article, starch. In using starch, first moisten the starch with cold water, then add boiling water, sufficient to obtain such a consistency that it will barely run off the spoon. When mixed with the salicylate solution this paste is considerably thinned down, thus carrying a better emollient property. Simplicity is furthered not only in the putting up of the preparation at the hands of the pharmacist, but also by the dispensing of a smaller quantity. Should the other method be advisable, the solution of sodium salicylate may be mixed with the mucilage of acacia, for instance, by the pharmacist, under which conditions the directions should call for the injection of a given amount of the prescription.

It is important to go into the procedure of the injection, in order that the method may not fail through lack of attention to certain details. He advises the use of a "baby bulb syringe," sometimes called the ear irrigating syringe, for use in administering an enema to an infant. The material properly mixed is sucked up into the bulb, the tip is thoroughly lubricated, and all air expelled before the introduction is attempted. Plenty of vaselin should be used about the anus and on the syringe tip in order that as little irritation as possible will be experienced in slowly introducing the inch and a half of nozzle. This is best accomplished with the patient lying down, but it is not required that he be upon his back, either side being permissible providing greater comfort is obtained. The gravity method, with catheter and funnel, is used to advantage in ward routine.

It is a standing rule that the rectal administration be attempted only after one hour has elapsed from the time of the movement of the bowels. If the movement has been a spontaneous one, the lapse of one hour is usually ample to lessen the local irritability, while if an enema is required, it may be advisable to wait somewhat longer in order to insure the material being retained. Irving takes the stand that the injection be retained at least one hour for absorption, so that if expulsion has taken place within this time, he advises that the process be repeated.

Older children tell us that in from fifteen to forty-five minutes there may be some headache and ringing of the ears, this being followed by something of a quieting action, although acute joint pain may subside within a relatively shorter time. Very frequently there is a fairly marked drop in the temperature, as well as a lessened tendency to having a temperature within the next twelve to twenty-four hours. Under most conditions alkalies are given, and unless there is a contraindication, the taking of a large quantity of liquid is urged. Both these procedures seem to enhance the salicylate action, and contribute to the lessened likelihood of untoward symptoms.

His experience has been the finding of no case of serious toxic action—hemorrhage, delirium, cyanosis, prostration, vomiting, or coma. Two children showed a fairly marked skin eruption, although it may be said that one of these patients was found to be receiving from an outside source a bromide preparation used in the treatment of a recurrent chorea. In four children there was a distinct loss of appetite, while three other children suffered from diarrhea following the use of a certain preparation of the salicylate. So far as it could be determined there were no other ill effects from the use of the sodium salicylate.

Irving concludes that:

1. Salicylate in the form of sodium sali-

cylate may be conveniently administered per rectum.

2. The rectal administration may be considered safe in the hands of an attendant with ordinary intelligence or without special training.

3. Relatively large doses may be given once or twice daily.

4. By this method of administration the stomach is particularly free of irritation.

5. In case of untoward effect the giving of a simple enema will remove the unabsorbed material.

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## Some Common Mountain Ailments and How to Combat Them.

HUDSON, in the *Lancet* of December 22, 1923, says that to take first what is usually known as mountain sickness, it should be mentioned, at the outset, that true mountain sickness does not occur until very high altitudes are reached. An interesting account of mountain sickness, and the sensations experienced at great altitudes—for example, 8000 to 20,000 feet—will be found in "Travels Amongst the Great Andes of the Equator," by Edward Whymper, where the effects of very high altitudes (and consequently low pressures) are carefully analyzed as regards pulse, body temperature, breathing capacity, fatigue, and general sensations. What we are concerned with here, however, are the usual feelings of discomfort experienced by some people in ascending to a moderate altitude, and these are due to want of acclimatization. As Turban has long insisted, every one who comes up out of the lowlands into the high mountains has to go through a process of acclimatization, even though he may not be aware that it is taking place. The following points should be remembered: As one ascends, the barometric pressure falls, and corresponding with the lower barometric pressure there is a fall in temperature. The humidity of the air, also, is much less, and the upper layers are very dry. Owing to the absence of water vapor, dust, smoke, and microörganisms, the heat rays of the sun pass much more freely at high altitudes, and are very much more active; this is also the case with the light rays and the chemical rays. The radioactivity of the sun is greatest when the winter snow has fallen.

Upon the healthy person the general effects of altitude may be summed up as follows: The metabolism of the body is increased, the respirations and the pulse rate are quickened, and the body temperature tends to be slightly higher than at sea-level; in other words, even at a moderate altitude, such as 4000 to 5000 feet, the usual height of a mountain resort, the rate of living is higher. Another point is that at sea-level the normal red blood-count is about 5 million corpuscles per cubic millimeter, and the percentage of hemoglobin about 90; at an altitude of about 5000 feet, the blood in order to compensate for the diminished tension of oxygen in the air becomes richer in both red cells and hemoglobin, the average red count at such an altitude being 7 million red cells per cubic millimeter, the hemoglobin 100 per cent or even more.

Thus it will be understood that in order to get used to a high altitude the bodily functions have to become somewhat modified, and for this to be established a little time is required, varying from a few days for the ordinary healthy person to three or four weeks for those with less responsive power, or those who are definitely ill. Until the person is acclimatized there is a liability to feel a little discomfort; for instance, shortness of breath after exertion, palpitation, a feeling of oppression at night, sleeplessness, headache, and general malaise.

Persons, therefore, going out to Switzerland for strenuous winter sports, such as skeeing, should take things somewhat easy to start with, and gradually accustom themselves to the altered conditions. To go for long expeditions directly on arrival is foolish, and is looking for certain trouble. For a person of nervous temperament to do so may imperil the entire advantage of the holiday.

Bad sunburn is not common in midwin-

ter, but it is a real danger to be reckoned with from February onwards. Sunburn depends upon various factors, of which altitude is the most important; the higher one goes the more likely one is to get sunburnt. New snow is more effective in producing this than old snow. On the unprotected, unpigmented, and unprepared skin of persons coming out from England, long exposures to the hot Alpine sun, combined with the glare from the snow, can cause very severe burns. There may be produced definite toxic symptoms and fever. The most simple means of preventing this is to grease the face; for this purpose cocoa-butter is good, and two other preparations, both of which are excellent protectives and can be obtained in Switzerland, are Sech-eyé cream and anti-lux.

Snow blindness, like sunburn, is more likely to occur with new snow than with old snow, and at higher altitudes rather than at lower ones. The eyes become very sensitive to light, and the lids may become puffy and cracked, and may be glued together with dried secretion and refuse to open. There is much lacrimation. The pain is acute, and the whole condition is one of extreme discomfort. It can, however, be easily guarded against by the simple measure of wearing the amber-colored glasses suggested by the late Sir William Crookes.

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### Gastric Ulceration.

The *Lancet* of December 29, 1923, states that the thoughtful surgeon has an inveterate conviction of the ephemeral nature of his work. He knows that there can be no finality in surgery until surgery is banished from the treatment of disease. Eventually, injury alone will demand the exercise of surgical skill. This change is slowly but surely taking place before our eyes. Not many years ago the excision of tuberculous cervical glands was amongst the commonest of operations performed in a London hospital; now it is almost a rarity. Improved methods of combating disease have allowed us to dispense with the resort to the knife. Neligan reminds us in this issue how, in the treatment of liver abscess, open incision is giving place to aspiration. The same revolution has taken place in the treatment of tuberculous joints, whilst it seems fairly safe to predict the elimination of surgery in the treatment of malignant disease when the secrets of this scourge have been revealed to scientific investigation. It is, therefore, to be accredited as a virtue when a surgeon is found to relinquish an established method for one he finds more effective in accomplishing his purpose.

These truths of surgery are driven home by Sir Berkeley Moynihan in two recent lectures on the "Treatment of Gastric and Duodenal Ulcer." "A physician doomed to practice surgery," as the author calls himself, Sir Berkeley has brought an essentially critical mind to bear upon problems arising out of an experience of no less than 718 cases of ulceration of the stomach and duodenum, where the diagnosis was established by actual inspection on the operating table. The conclusions to which he has been impelled by sheer weight of evidence demand our attention and enforce our belief.

In the diagnosis of a gastric ulcer the author relies upon two things, the history of the illness and the radiographic examination. There is only one way of establishing the existence of an ulcer beyond dispute. It is to see it. *X*-rays will often render the ulcer visible before the withdrawal of the "curtain of the anterior abdominal wall." As to the symptoms, there is a rhythm which is characteristic of gastric ulcer, another significant of duodenal ulcer, and a sort of rhythm of activity alternating with apathy, with a period lasting over weeks or months. Punctuality in the onset of pain or relief from it is of diagnostic import. In this series of cases, duodenal ulcer was encountered much more often than gastric ulcer, and Sir Berkeley maintains that the latter is seldom within 2 inches of the pylorus and so does not commonly give rise to pyloric stenosis. Narrowing in this region is the result of extension of duodenal ulceration, a process which may go beyond

the pylorus into the stomach itself, where a malignant change may supervene.

It is possible at this stage to come to some conclusion of value concerning that difficult decision as to the efficacy of medicinal methods of treatment at our disposal. Medical treatment rarely leads to sound healing, and demands such enduring care on the part of both patient and physician that it becomes too irksome as a practical measure for those who must take part in the ordinary intercourse of the world. Sir Berkeley, in the cases in which the only possible operation was a jejunostomy, has been able to watch the alteration in *x*-ray appearances from time to time. He finds that healing, as evidenced by change of shadow outline, is always a matter of many months and in some cases of years. Neither is the disappearance of the niche, as seen by barium meals, always proof of healing. This fallacy was demonstrated by Hollander. Many gastric ulcers resemble those intractable leg ulcers which repeatedly break down and persist until the end of life. It is without exaggeration to say that the medical mortality from perforation and hemorrhage is vastly greater than that incidental to surgery, which in a very high percentage of patients leads to a permanent cure. In Sir Berkeley's large personal series, there has been no operative death since 1912. There is one other argument brought forward to support the surgical attitude in the treatment of gastric ulcer, the belief that cancer arises in the simpler lesion. This does not carry the weight of the considerations set forth above, for a very competent group of pathologists deny the frequency of malignant degeneration on firm histological grounds. Cancer, according to them, does sometimes originate in the margin of an ulcer, but quite rarely.

However this may be, surgery seems definitely to have established itself as the only effective treatment for gastric ulcer. What should be the method of surgical attack is an almost equally vital question to decide. Opinion is not quite unanimous yet on this point. Sir Berkeley has tried many procedures. Generally speaking, he has concluded that gastrojejunostomy is most widely applicable and effective in duodenal ulceration, whilst excision of the pyloric segment of the stomach with lateral implantation into the jejunum by the "no-loop" method, devised by himself, is almost ideal in the treatment of the gastric lesion.

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### Outline of a Method of Non-surgical Management of Gastric Ulcer.

SMITHIES, in the *American Journal of the Medical Sciences* for December, 1923, advises rest in bed. Physical and mental rest for from one to three weeks; bodily and psychic activity alike are capable of stimulating peristalsis.

Complete rest demands avoidance of food per orem, irritating medicine, gastric lavage, and frequent abdominal examinations of the suspected focus.

Painful spasms are prevented by having constantly applied to the abdomen compresses saturated with a hot solution of alcohol and boracic acid. These compresses may be kept heated by an electric pad or partly filled water bag and should be worn day and night without interruption.

Keeping the stomach empty of food promotes healing by limiting local irritation from the food itself, by reducing the amount of gastric juice required to digest food, by limiting gastric peristalsis, and by avoiding painful gastric spasms, which last tend to prevent free circulatory interchange at the ulcer-bearing area. Abstinence from food by mouth should be insisted upon for from three to seven days, according to the type of patient under care. The period of fast is determined best by the clinical disappearance of gastric spasm (pain, regurgitation, "water brash," "heartburn") and by fluoroscopical proof of absent or diminished gastric peristalsis. During the fasting period, paraffin wax is chewed for ten minutes every hour. The wax mechanically keeps the mouth clean, promotes free flow of protective saliva and mucus, prevents parotitis, aids in counteracting the development of painful hunger contractions and gastric spasm, local and general, and allays thirst.

During the fasting period rectal feedings are instituted. From 300 to 600 calories of nutrient mixture are given each twenty-four hours in approximately 1000 cc of normal salt solution. He uses a clyster containing 1 ounce of 50-per-cent alcohol, 1 ounce of glucose, and normal salt solution to make 240 cc. The nutrient enema is given at body temperature by the drop method. The drops flow at the rate of 30 to 60 drops a minute, and at least four such clysters are given in twenty-four hours. Should the patient be in great pain or affected with pronounced gastric irritability during the first day of rectal feeding, tincture of opium or tincture of belladonna (10 drops), or both, are given in each nutrient enema.

When mouth feeding is begun (usually from the third to fifth day) two principles control the basis of diet: (1) nourishment should be liquid and administered warm in small quantities, and these given frequently; and (2) carbohydrates should be selected.

Small quantities of liquid food should be frequently administered in order that the stomach may empty rapidly, with the least effort on its part, and thus it may remain food-free for the longest time. This procedure makes available the maximum time for rest at an ulcer site. Jejunal digestion must be called upon until gastric conditions warrant functional activity by the stomach. A fasting, food-free stomach contains hydrochloric acid or pepsin at a minimum. When the feeding per os is begun, from 2 to 4 ounces of warm liquid nourishment are given each waking hour. When gastric irritability is very pronounced and the patient is in great need of food, carbohydrate mixtures may be given intermittently or continuously with the aid of a duodenal tube, constantly *in situ*.

As experimental facts have established, of all basic foods, carbohydrates leave the stomach most quickly and give rise to the minimum amount of functional activity. Therefore, liquid carbohydrate mixtures (barley water, rice gruel, thin cream of wheat, dextri-maltose, ovaltine, malted milk, thin creamed vegetable soup, etc.) are allowed. Milk is not given as routine. Milk results in almost pure protein clots in the stomach during its preparatory stages of digestion. In the stomach these clots act precisely as do other proteins: they remain for a long time, act as sources of irritation, as stimuli to acid and pepsin secretion, and furnish choice culture media for bacteria. If milk be given at all it should be first parboiled, citrated or predigested. If the gastric contents are low in acid and their bulk is carbohydrate, slight demands are made upon the stomach as regards either secretory or motor activity. The pylorus thus remains free from prolonged systoles and quick gastric emptying follows. By this means the stomach avoids gastric stagnation and the intragastric accumulation of relatively high free and combined acids; particularly their accumulation in a viscus whose tonus or tension is apt to be greater than normal. This free gastric emptying prevents the development of hypernormal peristalsis, the influence of which factor is potent in the prevention of physiological rest (secretory and motor) to the ulcer area. It also renders unnecessary frequent, disturbing, gastric lavage or the exhibition of huge quantities of alkaline drugs.

Limitation of the overproduction or overaccumulation of free gastric acid is obtained by keeping the stomach food-free as above described. The ordinary stomach secretes very little HCl and pepsin after a forty-eight-hour fast; its peristaltic activity is held in abeyance or very feeble after this interval. The stomach is then in a state as ideal as possible for epithelialization at the ulcer site.

If the above points, as established by modern physiological research, are borne in mind, the exhibition of large quantities of alkali or other medicines is unnecessary. Many of the writer's patients receive no medicine whatever by mouth. Pain, vomiting, and regurgitation and pyrosis quickly disappear. Healing is accelerated and duration of hospital residence is shortened. Providing the gastric lumen is patent, the stomach empties freely; there is no stagnant, irritating residue requiring frequent lavage in order to insure the subject's comfort. Large quantities of alkali, according to Pawlow and to clinical and laboratory ex-

perience, create pernicious increases of gastric acid and of mucus. Relief by lavage is then demanded. It would seem an absurd and contradictory clinical procedure to exhibit alkalies and thus create an intragastric state, which then calls for removal of the accumulated foreign mass in order to insure a patient's comfort. It is true that often large quantities of alkali bring about relief of symptoms, but mere symptomatic quiescence in no way indicates healing of gastric ulcer. The stomach has a remarkable capacity for neutralizing huge doses of alkali if it is compelled to do so, but there is no physiological reason why it should be called upon thus to overwork, when, physiologically, secretory activity may be controlled by fasting and later by diet.

It will be remembered that the normal habitat of gastric epithelium is an acid or, at the best, a neutral medium. If such epithelium is made to live in the presence of excess alkali, it lives under the handicap of an environment foreign to it constitutionally. Experiments in artificial tissue growth have shown that cell proliferation is retarded by hypertonic alkaline quite as well as by high acid solutions. Hence, overalkalinization may actually prevent healing. Attempts at protection from this foreign body (excess alkali) are shown by the acid-producing glands oversecreting; by the mucoid degeneration of physiological fatigue, which results in the throwing out over the secretory glands of a protective layer of mucous; and by delay in repair. Excess or continuous exhibition of alkali results in enormous secretion of acid and mucus; this is at least a partial explanation of the so-called "hypersecretion" associated with gastric ulcers, particularly when such are treated by the continuous alkalinization method first proposed by Leube, and frequently since then resurrected under a score of names.

To combat the state of affairs subsequent to alkaline exhibition, the patient's stomach must of necessity be washed frequently or increasingly greater quantities of alkali must be given to overwhelm the stomach's defensive mechanism; then there follows physiological fatigue or exhaustion of the acid-secretion mechanism. It is a common observation that such patients as are treated for ulcer by the overalkalinization procedure always require frequent gastric lavage to insure their comfort. This frequent lavage is to be condemned not alone because it acts contrary to the fundamental principle requisite for healing, namely, rest of the affected part, but also because it creates distress in patients already undernourished, nervously and physically wearied, may be the cause of serious accidents, and, moreover, is an unwarranted procedure scientifically. To those who, fluoroscopically, have watched the behavior of a stomach during lavage it is self-evident that the maneuver defeats this primary principle of healing. Commonly, lavage is accompanied by vigorous gastric contractions; these persist not only during the procedure, but frequently persist for an appreciable time afterward.

If dieting and general management are planned as above outlined lavage is not demanded for comfort. In the past eleven years Smithies has not employed lavage therapeutically in ulcer cases more than a dozen times. Lavage is so rare a procedure in his clinic that his associates and patients consider it as almost contraindicated. It can be readily judged how a treatment, of which lavage does not form a prominent feature, contributes much to a patient's peace of mind and shortens the period of hospital incarceration.

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### Surgical Treatment of Phthisis.

In the discussion on this subject before a recent meeting of the Royal Society of Medicine, given in the *British Medical Journal* of December 8, 1923, Riviere said that cases suitable for pneumothorax usually came to the physician with disease already crying out for treatment. It was only a particular type of pulmonary tuberculosis which was suitable for collapse therapy, and this type often reached a definite diagnosis only when moist sounds already covered a good part of one lung.

Earlier the disease escaped diagnosis because it was deep and out of reach of the stethoscope. The common type of deep-seated or hilus tuberculosis was double. In the fortunate cases suitable for collapse therapy only one lung was seriously affected. The *x*-rays showed an "interstitial" spread on both sides, but the parenchymatous outbreak following this was in these cases confined to one side only. The majority of such cases were found in adolescence.

It was common to see patients with advanced one-sided disease from the standpoint of physical signs but with double disease to *x*-rays. Therefore a radiogram should always be used in deciding suitability for pneumothorax. The better lung was seldom quite free; there was generally a thickening of strands seen by the *x*-rays, but if these were not very lumpy and if the outline of the lung field was clear or contained only a few sharp-cut shadows the lung would probably function safely whilst the other was collapsed. To the stethoscope the better lung would probably appear quite clear, and if at a later stage the disease spread and became active in this lung the first clinical signs were found, not at or near the apex, but about the mammary region or in the axilla.

It was remarkable how in the class of case described the disease might have spread through the whole lung, and surface signs might have been present for a long time, and yet complete collapse by pneumothorax might be obtainable. A lung should never be presumed adherent without pneumothorax having been tried. Negative pressure might draw heart and mediastinum into one side of the chest and deform the diaphragm without any pleural adhesions being present. When pneumothorax completely failed through an adherent pleura, or only a partial and ineffective pneumothorax could be obtained, the question of further surgical measures would arise. In cases of a partial pneumothorax often a patient trial would be needed before its work could be fully gauged. If its effects on symptoms were unsatisfactory, if large cavities were left uncollapsed, or if, in spite of measures to prevent it, large febrile reactions followed the refills, additional methods of lung collapse should be used. The cauterization of adhesions might help, but usually thoracoplasty, with or without a pneumothorax, would be necessary. He himself had had no experience of a combined pneumothorax and thoracoplasty, but in certain cases it should prove rational by avoiding the permanency which was perhaps the most embarrassing feature of thoracoplasty and similar operations. If pneumothorax alone had been tried and had failed, the "better lung" must be examined with yet more meticulous care before a thoracoplasty was advised, for further factors now came into consideration—the finality of this further move, the strain of operation, and the yet more violent mechanical and toxic disturbance brought about.

In these cases there must often be a choice between an operation of doubtful outcome and, on the other side, certain death. The patient's interest must be placed before the physician's reputation, but these operations should not be dragged into undeserved discredit. Of other indications and contraindications, good nutrition was an important asset and cachexia a decided contraindication. The heart would have to meet considerable strain and must be fairly sound. Intestinal tuberculosis was an absolute contraindication, but a moderate laryngeal lesion might be allowed. Certain methods of operation other than thoracoplasty might be cited. Multiple adhesions might be separated by opening the pleura through an intercostal space; single or few adhesions might be divided without opening the pleural cavity. These methods were sometimes useful. With regard to the pneumolysis, the parietal pleura was easily stripped from the endothoracic fascia; thereby the lung was collapsed, but a space between lung and chest wall remained. This could be filled with gas or air or with fat or paraffin. In each case the risk of sepsis was considerable. The disadvantages of thoracoplasty

as compared with pneumothorax were: first, the strain of the operation and the rapid collapse of the lung with autointoxication and risk of aspiration pneumonia; secondly, the collapse was permanent—there was no return; and lastly, the collapse might not be sufficiently complete to arrest the disease. In this case 'supplementary measures might be used.

Davies agreed that pneumothorax should be the first surgical maneuver tried. If the collapse were complete the result was excellent. Often, however, pneumothorax failed completely or partially because of adhesions. If there were a broad adhesion and pneumothorax was continued the adhesion did not break but the lung ruptured and a pyopneumothorax resulted. Other methods of removing adhesions were to introduce a thoracoscope and remove them by the electric cautery; others might be dealt with by a special tenotome; and yet again, in cases more extensive, the chest might be opened and the adhesions exposed, ligatured, and cut. Another method he would like to mention was section of the phrenic nerve. This was useful in cases of pneumothorax where there were adhesions between base of lung and diaphragm. In these patients cough was a troublesome symptom. If the phrenic nerve were divided the cough went. If the diseases were localized to the upper lobe he advocated apicolysis. Paraffin or wax, not gas, should be used to fill the cavity remaining. The danger lay in the fact that paraffin might be extruded later, with the risk of secondary infection. Fat was better, but this might liquefy and then be extruded. If the adhesions were more extensive thoracoplasty was necessary. He had found that local anesthesia alone was too great a strain. He now uses procaine, alcohol to paralyze the intercostal nerves, and a little chloroform may be inhaled. He strongly advocated the paravertebral incision. The ribs must be removed right back to the transverse processes. The first rib especially must not be neglected. He had found a one-stage operation best. There was little deformity. In children the axillary incision might be used.

Beaumont emphasized the very small number of patients suffering from pulmonary tuberculosis who required any operative treatment. The percentage had been variously estimated at from 2 to 20. He would suggest that the indications for a pneumothorax were: (1) patients with unilateral lesions who failed to respond to one month in bed on absolute rest; (2) similar patients who responded to rest in bed but in whom getting up was followed by active manifestations; (3) hemoptysis which did not respond to other measures. The type of operation necessary was a decision for the surgeon and not for the physician.

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## Treatment of Neurosyphilis with Sulpharsphenamine.

HALLORAN, in the *Boston Medical and Surgical Journal* of January 10, 1924, states that because of the incompleteness of his series of cases, definite conclusions as to the advantages of sulpharsphenamine over other well-known arsenicals cannot be drawn at this time. However, with the data at hand several suggestions seem justifiable:

Sulpharsphenamine is extremely simple of preparation and administration.

It has a comparative freedom from local and general reactions.

It may be administered intramuscularly without ill effects. This is advantageous where veins are inaccessible and seems as effective as treatment by the intravenous method.

The symptoms of renal irritation following several treatments are not satisfactorily explained. They may be due to excessive dosage or a cumulative toxic effect upon the kidney. This should have further investigation.

The production of glycosuria in one case also does not permit satisfactory explanation at this time.

An acute iritis in one case may be due indirectly to treatment, but it seems hardly fair to base any conclusion on one case.

Thus far the spinal fluid changes compare favorably with those produced by the arsphenamines. There seems to be a cer-

tain uniformity and rapidity of alteration of diagnostic standards in advanced, unselected cases which have not been noted with other forms of treatment. This may indicate a greater toxicity of sulpharsphenamine for the spirochetes of the central nervous system.

Practically all in his series were cases of advanced neurosyphilis. Treatment in early cases may show more striking therapeutic effects.

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### Acute Lumbago.

RUSSELL, in the *British Medical Journal* of January 5, 1924, states that those of us who have had personal experience of "the exquisite pain" caused by an attack of acute lumbago ought to be specially grateful to Souttar for his quinine and urea hydrochloride discovery. [Already referred to in our Progress columns.—ED.] As regards the drug itself he has used it for years, but it had not occurred to him to use it as Souttar has done.

As to the acute attack, Russell is sure that it is due to the retention in the dorsal fascias and aponeuroses of waste substances, which exercise, with other measures, would have prevented. In his personal experience the attack has come on when making some ordinary movement in the process of dressing, or even by a cough. The feeling is as if something had snapped or been torn at a point somewhere about the crest of the ilium, and then the back muscles go into extraordinarily painful and disabling spasm. He doubts this is a "protective fixation": it is more like the explosion of a munitions dump. The pain of the tear, or whatever it is, is quite a tolerable affair; it is the exquisite pain of the muscle spasm, and the ease with which it is induced, which is so disabling. Eleven years ago he had a very severe attack, and as soon as he was able to move he was treated electrically by a friend and colleague. The effect of the treatment was entirely to remove the spasm element, although the pain of the torn point remained.

His next attack began in the second week of December, 1923. It was comparatively mild to begin with, but a sudden movement induced the snap and the paralyzing spasm. He had quinine urea hydrochloride at hand, and he got a medical friend to give him an injection which contained 1 gramme of the drug in 5 cc. Souttar used a 1-per-cent solution, and that is apparently sufficient. This injection was given into the hard mass of contracted muscle, which was tender when touched. In less than an hour the spasm was much relieved, and in quite a short time the tendency to disabling spasm was checked. There remained, however, a second torn spot, further out along the iliac crest, which was causing a local spasm, so he had the injection repeated on the following day, and with an equally satisfactory result.

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### Diabetic Coma with Anuria.

IMRIE and SKINNER, in the *Lancet* of January 5, 1924, state that the remarkable feature in the case which they report is that the changes occurred quite independently of renal excretion, for though the kidney was playing no part in the removal of glucose and acetone bodies from the blood, or in the regulation of the acid-base equilibrium by the excretion of an acid urine, an adjustment toward the normal was nevertheless brought about to such a degree that the patient emerged from the coma. It would seem that this must have been due to the oxidation processes in the tissues. With the utilization of glucose there would be oxidation of the ketone bodies, with a liberation of bases and a corresponding diminution in the acidosis.

Such an assumption receives support by the following considerations: The ketone bodies in the blood, expressed as acetone, were 59.13 mg. per 100 cc just before the insulin treatment was begun. By the next afternoon they had decreased to 6 mg. per 100 cc. Therefore, from every 100 cc of blood 53 mg. of ketone expressed as acetone had been removed. Assuming that

the ketone bodies were present in the form of *B*-hydroxybutyric acid, then from each 100 cc of blood 96.89 mg. of this acid which would require 21.42 mg. of the base sodium to neutralize it were removed. With the oxidation of this acid the base would be liberated and accordingly increase the plasma bicarbonate, for the carbon dioxide tension of the blood is such that all the base available after the more highly dissociated acids are neutralized is converted into the bicarbonate; 21.42 mg. of sodium are capable of combining with 41 mg. or 25.7 cc of carbon dioxide as the bicarbonate. Were this the only reaction taking place in so far as the oxidation of the *B*-hydroxybutyric acid is concerned, the plasma bicarbonate should increase 20.87 volumes per cent. As a matter of fact it did increase from 15.7 to 39—that is, 23.3 volumes per cent. The non-protein nitrogenous constituents of the blood were increased.

Twenty-four hours after the onset of the anuria 110 mg. per 100 cc were present in the blood. Their value rose to 117 mg. on the following day and fell to 107 mg. before death. These values are similar to those observed in uncomplicated cases of suppression. In their case, with the chronic changes observed in the kidney at autopsy, it is quite possible, in fact likely, that the high non-protein nitrogenous content existed some time before the onset of the diabetic coma or the anuria.

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### Antirachitic Effect of Cod-liver Oil Fed During the Period of Pregnancy or Lactation.

Hess and Weinstock, in the *American Journal of Diseases of Children* for January, 1924, state that their experiments indicate that cod-liver oil, when given to the mother during pregnancy, cannot be relied on to protect the offspring from rickets. Furthermore, the active principle of the oil is not excreted in the milk in adequate amount; rats receiving even large doses of cod-liver oil were unable to afford protection to their young, which were subsequently placed on rickets-producing diets.

On the other hand, cod-liver oil did confer subsequent protection when fed to the young during the latter half of the lactating period directly and not through the medium of the mother's milk, demonstrating the essential difference between direct and indirect nutrition. This protective power suggests that the specific factor in the oil can be stored by the young and drawn on in time of need. Although it cannot be taken for granted that these results are applicable to human rickets, it is probable that such distinction as exists is one of degree rather than of kind.

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### The Therapeutic Use of Oxygen.

Bourne, in *The Practitioner* for January, 1924, states that with regard to pneumonia two points may be discussed. The subjective dyspnea is not the symptom for which oxygen is given; the rise in respiration rate in this disease is probably due not to diminution in functioning lung tissue so much as to a toxic effect upon the respiratory center. This toxic effect is not removed by oxygen, nor is the dyspnea which results from it.

Secondly, the type of pneumonia best influenced by oxygen is that in which, in addition to consolidation, considerable edema is present adjacent to this. Presumably, whereas the swollen alveolar walls are relatively impenetrable to a normal oxygen-tension, they yield to one that is somewhat raised. Clinically, therefore, the pneumonia most likely to be benefited by oxygen is the one accompanied by some cyanosis and many râles and rhonchi. Oxygen should, however, be given as a routine in all cases of pneumonia.

By passing the gas to the posterior nares through a rubber catheter, the sides of which have been lubricated with a novocaine ointment, the gas is carried in sufficient quantity and without annoyance to a position whence inhalation is ready and rapid. An ordinary catheter may be strapped to the cheek, but the writer has

found that the light portable apparatus is, if anything, more useful. Briefly, a circlet round the head holds a small flat plate of aluminum on the forehead. Screwed to this is an aluminum wire with a loop at either end holding the rubber catheter. The lower loop holds it at the entrance to the nostril, thus preventing any slip. There is a considerable economy in oxygen consumption.

Having decided in any given clinical condition that anoxemia is present or imminent, oxygen administration should be undertaken. The actual administration of the gas by the intranasal method is so simple as to require no further description. Stress must be laid, however, on two points —the dose of the gas and the treatment of the patient's psychology.

If anoxemia is suspected, or if cyanosis is present, and is taken as a rough clinical guide to anoxemia, oxygen should be given till this disappears, for the proper dose of any drug is "enough to produce the desired effect." Having banished the cyanosis, it will probably be found that a few administrations, lasting one hour each per diem, will be sufficient. In cases of severe oxygen-lack there is no reason why oxygen should not be given continuously day and night. The intranasal apparatus, if properly adjusted, does not interfere with sleep.

Even more important is the treatment of the patient's mental condition. Thanks to the number of death-bed scenes at which the drug has been a gloomy and an impotent witness, oxygen is regarded with horror by many patients. When the medical attendant suggests its use, he is regarded with as much alarm as though he were already foretelling the end.

It must be carefully explained to the patient that nowadays oxygen is given as a drug regularly and to treat definite conditions; that the old-fashioned idea of using it merely as an emergency measure has been discredited; and that active coöperation on the part of the patient to overcome any temporary slight inconvenience is necessary.

A final point must also be explained. The patient must be told that in spite of the oxygen he will perhaps still remain dyspneic, for the dyspnea of pneumonia is often toxic rather than anoxemic in origin: that in spite of the persistence of the breathlessness the drug is really doing him good and is warding off further troubles.

In conclusion, one can recapitulate:

1. Oxygen is a potent drug.
2. Anoxemia is the condition best treated by oxygen.
3. Anoxemia is of frequent occurrence, and of some danger, in pneumonia, acute bronchitis, heart-failure, and several less common conditions.
4. Oxygen is generally given in a useless manner.
5. The intranasal method is the method of choice in general practice.
6. Oxygen dosage must be sufficient, regular, and continued.
7. It is very necessary to remove the patient's apprehension, and to gain his active coöperation.

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## The Treatment of Early Hereditary Syphilis with Intramuscular Injections of Sulpharsphenamine.

BOONE and WEECH, in the *American Journal of Diseases of Children* for January, 1924, conclude that:

1. Sulpharsphenamine is a safe and easily administered arsenical preparation for the treatment of hereditary syphilis in infants.
2. Sulpharsphenamine can be safely given to infants in a dose as large as 20 mg. per kilogram of body weight.
3. The reactions, either general or local, to treatment are very slight.
4. In 55 per cent of the patients, the Wassermann reaction became negative after one course of six treatments.
5. The symptoms of hereditary syphilis rapidly disappear, and the patient's general condition quickly improves after treatment.
6. Because of the ease with which sulpharsphenamine can be administered, it should be very useful to the practitioner who is not adept at intravenous therapy.

### The Action of Intravenous Injections of Sodium Bicarbonate upon the Kidneys.

In the *American Journal of the Medical Sciences* for January, 1924, KELLERT states that he has given to apparently normal rabbits, having normal urine, intravenous injections of 5-per-cent sodium bicarbonate in quantities per kilo in excess of those usually given to human beings for therapeutic purposes. No injurious action could be seen on observation of the animals and examination of the urine.

In a series of rabbits also, with a nephritis brought about by injections of potassium chromate, mercuric chloride, and uranium nitrate, similar use of sodium bicarbonate in equal or larger quantities, unheated in one set and autoclaved in another, resulted in no ascertainable harmful action on the kidneys. The animals receiving the injections of the chemicals and sodium bicarbonate showed no greater renal changes than those receiving the chemicals alone.

There is thus no experimental evidence, in the case of rabbits, for the belief that intravenous injections of sodium bicarbonate as used for therapeutic purposes are injurious to the kidneys.

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### Cupping in Asthma.

SIMONS (*British Medical Journal*, Jan. 5, 1924) states that many very bad attacks of bronchial asthma, all the later ones of which have been characterized by very distressing dyspnea with a cyanosed tip to his nose and dusky hands and feet, decided him to winter in the Riviera, but unfortunately, on going to Costebelle, he met the "mistral," and immediately succumbed to such a bad attack as to cause him to ask the services of a French colleague who practices in Hyères.

Courteous, cheery, businesslike, with a way of getting to the heart of things in a very few moments, he heard his tale, made his examination, and told him that he must be cupped! To say that he was staggered is not overstating it, as in England cupping went to school with bleeding and both died in the same year. Seeing his hesitation he promised that it would give him immediate relief. How could he do anything but accept at once the advice he had asked of his courteous colleague? "Wet or dry?" he queried, and was told that dry cupping was all he intended, and that twenty-four cups would be used. When about twenty cups were reached Simon began to have a most uncomfortable tight-skinned feeling.

For a quarter of an hour he sat like a glass-bristled hedgehog; then the cups were taken off, each with a sucking "pop," and the result of each proclaimed in loud encouraging tones—"Noir, noir!" meaning that the site of the cup was occupied by a deep black bruise; a few "un moitiè," not so black; and one "inutile," only looking like a bad black eye.

What of the result? Nearly immediate relief! And not a grudging relief, but one in full measure. The dyspnea was markedly and immediately easier, the cough relieved, and he had a good night's rest. In all his attacks Simons says he never had so striking an improvement in so short a time.

Are we perhaps prone to abandon all methods of tried utility for something new because it is new? Is there not every physiological reason to believe that cupping or phlebotomy is the obvious and proper treatment for an engorged right heart? Have we anything else so certain, so rapid, and so easy? Simons says he does not know of it.

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### Light—Its Action on the Skin and Therapeutic Value.

MACLEOD, in *The Practitioner* for January, 1924, states that the value of the treatment of certain diseased conditions of the skin by the actinic rays of light is now recognized, and ever since Finsen, of Copenhagen, introduced it for tuberculosis of the skin, this method of treatment has been in common use in almost every dermatological clinic. The *modus operandi* of the treatment by concentrated actinic rays is by the production of a powerful cutaneous reaction which destroys the pathological cells,

and, when the inflammation subsides, replaces them by new fibrous tissue, and at the same time assists the direct action of the rays in killing microörganisms. In the case of tuberculosis of the skin there is no treatment which gives more satisfactory results. Unfortunately, it is so tedious that it is only worth while where exposed parts, such as the hands and face, are affected.

In the skin department at Charing Cross Hospital, where this treatment has been in operation for twenty years, there has been ample opportunity of judging its value, and though the number of cures by it is not so large as that claimed by the Finsen Light Institute, permanently satisfactory results have been obtained in about 40 per cent of the cases, and decided improvement in most of the others. These statistics are fairly reliable, for the patients are encouraged to come from time to time to the hospital to exhibit themselves, and requested to report at once should any definite relapse be detected. The concentrated light treatment has also been found to be of benefit in the treatment of other ulcerative and granulomatous conditions, such as septic granulomata, chronic ulcerations, carbuncles, and suppurating ringworms. Its action is also of value in stimulating hair growth in alopecia areata.

Recently, special attention has been directed to the therapeutic value of diffuse light baths, either from direct sunlight or from open carbon arc lamps. In connection with tuberculosis of the skin they have been found to be a valuable adjunct to the treatment by concentrated actinic rays, and in occasional cases healing of the local lesion has been obtained by light baths alone, not only where the tuberculosis was present in the skin, but also where it involved the mucous membrane of the nose. Reyn, of Copenhagen, estimates that in cases of lupus vulgaris treated by concentrated light, combined with light-baths, 80 per cent of cures are obtained, while with concentrated light alone only 60 per cent. Benefit from this combination has also been experienced by Sequeira at the London hospital. Light-baths have also given excellent results in surgical tuberculosis, and their obvious utility in improving metabolism has led recently to their beneficial use in states of malnutrition, such as anemia and rickets.

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### Germicidal Assays, with Particular Reference to Colloidal Silver Compounds.

HAMILTON in the *Journal of Laboratory and Clinical Medicine* for January, 1924, states that neosilvol is a colloidal silver chloride stabilized by use of a proteid. As a colloidal preparation it is devoid of any corrosive or destructive action on protoplasm, and can therefore be used without pain or injury, even on the most sensitive mucous membranes. It is fairly stable, even in the presence of alkaline or acid secretions, and excess of organic matter. It has the distinct advantage of being a rich creamy color instead of the brown or black-brown of the colloidal metallic silver compounds such as silvol and argyrol, and does not leave a stain. Its germicidal action, while slight in the case of certain organisms, is to a certain extent specific for the gonococcus, as is shown by the series of tests he presents.

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### The Treatment of Diabetes with Diet and Insulin.

JOSLIN, in the *Virginia Medical Monthly* for January, 1924, states that the diet in diabetes should be moderate in quantity. Excess in food is the most common precursor of diabetes, and it is therefore irrational to continue what has already proved harmful. For this reason the first step taken with patients beginning treatment should be to curtail the amount of food. Examination of Table I shows that upon the first day of the test diets (T. D. 1) the calories have been reduced to 1304, which is about two-thirds of the average calories taken by an adult weighing 154 pounds (70 kilogrammes). As a matter of fact, in practice he usually begins with test diet two (T. D. 2), which

amounts to 931 calories. If this reduction in calories does not result in making the patient sugar-free, advance is made to lower calories, which are found in test diet three and test diet four. As will later be shown, with the use of insulin one seldom needs to employ test diet four with its few calories or the next diet below it, and also below the line, with a still smaller number.

Reduction in carbohydrates accompanies the lowering of calories in the test diets employed to get the urine of the diabetic sugar-free. If the patient is passing very large quantities of sugar in the urine, one can begin with test diet one, though usually one commences with test diet two, which contains about 100 grammes carbohydrate. After one day of this diet, one can proceed to test diet three, with 66 grammes carbohydrate, and so on to test diet four upon the next day unless the Benedict test is negative. In former days still lower carbohydrates and less calories were frequently required to banish the urine sugar, and even a day of fasting would occasionally be interpolated, and thereafter one would progress day by day, C2 PF2, C3 PF3, etc., increasing the diet in both calories and carbohydrate until sugar reappeared. Then one would drop back a line or two (10 to 20 grammes) in carbohydrate and adjust protein and fat by increasing the protein fat (PF) number. To-day insulin shortens the stay, and one often jumps from T. D. 3 to C6 PF6, which contains nearly the same amount of carbohydrate, but distinctly more protein and fat.

The above system of gradually reducing the total calories and the carbohydrate until the urine of the patient becomes sugar-free, and thereupon gradually raising the carbohydrate until the carbohydrate tolerance is obtained and then making any necessary adjustments of protein and fat, accounts for the lessened prevalence of coma in hospital patients.

Under-nutrition is the key-note of all modern diabetic diets. He has laid emphasis on lowering of fat, Newburgh and Marsh on lowering of carbohydrate, and Petren especially on lowering of protein, but all are indebted to Allen for a preliminary lowering of total calories.

The protein requirement is fundamental. For a child 2 or 3 grammes per kilogramme are desirable, for a youth 1.5 grammes, for an adult 1 gramme, and after sixty it may be lowered to 0.66 gramme per kilogramme body weight. Not alone for maintenance of body tissue is the protein requirement fundamental, it is even more fundamental in severe cases to prevent acidosis. Pro-

TABLE I.—INSULIN DIABETIC DIETS.

| | Diets. | Total Diet. | | | | Carbohydrate (C). | | | | | | Protein and Fat (PF). | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbohydrate. | Protein. | Fat. | Calories. | 5% Vegetables. | Orange. | Oatmeal. | Shredded Wheat. | Uneeda. | Potato. | Egg. | Cream 20% fat. | Bacon. | Butter. | Meat. | |
| Test | T.D.1 | 181 | 46 | 44 | 1304 | 300 | 300 | ..... | 3 | 4 | 240 | 3 | 120 | ..... | ..... | ..... | 1 |
| | T.D.2 | 101 | 35 | 43 | 931 | 300 | 300 | ..... | 1 | 2 | 120 | 3 | 120 | ..... | ..... | ..... | 2 |
| | T.D.3 | 66 | 24 | 37 | 693 | 300 | 300 | ..... | ½ | 2 | ..... | 2 | 120 | ..... | ..... | ..... | 3 |
| | T.D.4 | 34 | 15 | 30 | 466 | 300 | 200 | ..... | ..... | ..... | ..... | 1 | 120 | ..... | ..... | ..... | 4 |
| Maintenance | C1+PF1 | 14 | 15 | 30 | 386 | 300 | ..... | ..... | ..... | ..... | ..... | 1 | 120 | ..... | ... | ..... | 1 |
| | C2+PF2 | 22 | 19 | 37 | 497 | 300 | 100 | ..... | ..... | ..... | ..... | 2 | 60 | ..... | 15 | ..... | 2 |
| | C3+PF3 | 32 | 24 | 37 | 557 | 600 | 100 | ..... | ..... | ..... | ..... | 2 | 60 | ..... | 15 | ..... | 3 |
| | C4+PF4 | 42 | 29 | 52 | 752 | 600 | 200 | ..... | ..... | ..... | ..... | 2 | 60 | 30 | 15 | ..... | 4 |
| | C5+PF5 | 52 | 32 | 66 | 930 | 600 | 200 | 15 | ..... | ..... | ..... | 2 | 60 | 30 | 30 | ..... | 5 |
| | C6+PF6 | 64 | 44 | 83 | 1179 | 600 | 200 | 30 | ..... | ..... | ..... | 2 | 120 | 30 | 30 | 30 | 6 |
| | C7+PF7 | 74 | 52 | 88 | 1296 | 600 | 300 | 30 | ..... | ..... | ..... | 2 | 120 | 30 | 30 | 60 | 7 |
| | C8+PF8 | 84 | 61 | 94 | 1426 | 600 | 300 | 30 | ..... | 2 | ..... | 2 | 120 | 30 | 30 | 90 | 8 |
| | C9+PF9 | 98 | 65 | 106 | 1606 | 600 | 300 | 30 | ½ | 2 | ..... | 2 | 180 | 30 | 30 | 90 | 9 |
| | C10+PF10 | 109 | 66 | 119 | 1771 | 600 | 300 | 30 | 1 | 2 | ..... | 2 | 180 | 30 | 45 | 90 | 10 |
| | C11+PF11 | 135 | 80 | 135 | 2075 | 600 | 300 | 30 | 1 | 2 | 120 | 2 | 240 | 30 | 45 | 120 | 11 |
| | C12+PF12 | 159 | 84 | 135 | 2187 | 600 | 300 | 30 | 1 | 2 | 240 | 2 | 240 | 30 | 45 | 120 | 12 |

tein underlies the proper balancing of fat and carbohydrate, the ketogenic-antiketogenic ratio. If the protein is 1 gramme per kilogramme body weight and only that amount of carbohydrate given which enables the patient to be sugar-free, the fat may be raised to thrice the grammes of carbohydrate. If necessary calories are not secured, the protein must be lowered to 0.66 gramme per kilogramme body weight, and then the fat can be four or even five times the carbohydrate, provided the carbohydrate is so low as to eliminate glycosuria. Under either of these conditions there is no danger of acidosis, or, in other words, the ketogenic-antiketogenic ratio is not exceeded. The calories required for a patient depend first of all on maintenance of strength and weight. They seldom vary far from 30 per kilogramme body weight in adults, but children may require twice as many. The foods which make up the diet of the diabetic should not be too varied. Otherwise they are confusing for both doctor and patient to estimate in carbohydrate, protein, and fat values. After demonstrating ability to keep sugar-free on standard foods, the patient may experiment with them. His aim is to make the routine diet as simple as possible.

Education of the patient in the prevention of coma is the second factor which has reduced his coma mortality. Patients have been taught for some years, whenever they feel "sick"—he seldom says "ill"—(1) to go to bed; (2) to take a cupful of hot liquid every hour, hot water, coffee, tea, broth, water-oatmeal gruel, or, instead of the gruel, orange juice; (3) to get a nurse in order to conserve strength and save burning body calories; (4) to keep warm; (5) to take an enema; and (6) to call the doctor. In other words, they are taught to regard any indisposition as premonitory coma. They are not to diagnose their cases.

An overdose is the second danger one encounters from insulin. This is known as a reaction and is associated with a lowering of the percentage of blood sugar below the normal level, 0.10 per cent. So soon as the blood sugar falls below 0.08 per cent certain definite symptoms appear, and perhaps the first notable symptom is extreme hunger. As the blood sugar falls to this figure, perspiration, which is often apparent upon the forehead, and tremor develop. If the blood sugar reaches 0.045 per cent or below, unconsciousness usually develops and may be accompanied by convulsions.

Perhaps not over two of the less than 100 reactions, which have occurred in the course of more than a year with his patients, have been accompanied by unconsciousness. This he ascribes to the use of small doses of insulin.

The antidote to a reaction from insulin is the administration of glucose. Commonly this is taken by the patient in the form of orange juice. It may be taken as corn syrup or actual sugar, because most sugars turn to glucose immediately upon ingestion. With children syrup or honey may be given when it is difficult to administer more liquid foods. Ten to fifteen grammes of glucose suffice as a rule to banish the symptoms of a reaction and the antidote may work within five minutes. Adrenalin acts similarly, and 10 minims of a 1:1000 solution injected subcutaneously act promptly. One should be somewhat cautious, however, in the administration of adrenalin to be sure that there is enough available carbohydrate in the body to allow it to be mobilized.

The first dose of insulin administered to a patient at the New England Deaconess Hospital is usually 1 unit, and this is increased by 1 unit before each meal until by the fifth meal the patient is taking 5 units before a meal. Thereafter 5 units are given about twenty minutes before each meal. At the same time the changes in diet take place which have been outlined above, because treatment with insulin should work hand in hand with treatment with diet. If the urine of the patient does not promptly become sugar-free, the dose is changed to 6 units before a meal, or even 7, 8, 9, 10, or more units. So soon as the urine becomes sugar-free, then the noon dose is usually omitted and the total dose divided

into two doses, that before breakfast being somewhat larger than that before supper.

If the patient remains persistently sugar-free upon a maintenance diet, the attempt is made to omit the evening insulin by gradually decreasing the dose by 1 unit every one or two days, and in a good many cases this is possible. Then one attempts to lower gradually the morning dose. As a matter of fact, about ten per cent of his cases treated with insulin have been able to omit it entirely.

Small doses have characterized his method of treatment. In fact, at the close of the first year of insulin medication there were but about 20 out of 300 diabetics taking insulin who were receiving 30 or more units of insulin daily. Insulin is in its infancy, and it has seemed advisable to proceed slowly with it. As a rule it has been necessary to increase the dose somewhat as time has elapsed.

The morning dose of insulin should usually be the largest administered during the day, and, conversely, the quantity of carbohydrate at breakfast should usually be the lowest. These rules, however, are not invariable. Before changing the dose of insulin it is always desirable to determine whether the carbohydrate is properly divided at the different meals. For this purpose single specimens of urine throughout the day should be tested qualitatively and the results balanced against the dosage of insulin and the intake of food. Patience and study will often obviate the necessity for an increase in insulin.

When the diagnosis of diabetic coma is assured, then insulin should be administered immediately and best intravenously for the first dose, though that is unessential. It is safe to give 10 units every hour, and usually safe to give 15 units hourly for the first three hours. Fifteen units of the new insulin equal 21 units of the old, so dosage creeps up rapidly. One continues to give insulin in hourly doses until the hourly specimen of urine becomes sugar-free or, if available, the blood sugar drops to nearly normal. It is essential each hour, before administering the insulin, to test the urine; otherwise severe reactions may be encountered. Following the commencement of recovery, insulin should be continued at less frequent intervals. It should not be permanently omitted. If this is done a relapse may occur. Each case is a rule unto itself.

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### The Hematopoietic Effects of Desiccated Red Bone-marrow and Spleen in Normal Humans.

LEAKE, in the *Journal of Pharmacology and Experimental Therapeutics* for December, 1923, states that experiments on normal humans confirm the reports previously made that desiccated spleen and red bone-marrow are more efficient erythropoietic agents in combination than singly. While the hemoglobin content is considerably increased under the influence of the combined extracts, its rise is not as great nor as rapid as the increase in the number of circulating red blood cells, but is better maintained. The increase in the erythrocytes seems to be due to increased bone-marrow activity. The combined spleen and marrow also cause a slight increase in the number of polymorphonuclear neutrophiles. No side actions were noted. It is suggested that the hematopoietic response of normal humans to combined red bone-marrow and spleen extracts may be used as a prophylaxis against mountain sickness, and in affording rapid acclimatization to high altitudes.

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### Pituitrin in the Treatment of Asphyxia Pallida Neonatorum.

CORMACK, in the *China Medical Journal* for January, 1924, states that having recently had two very striking results from the use of pituitrin injection in the treatment of asphyxia pallida in newly-born children, he thinks they were worth recording in the hope that others may try it in similar cases that do not respond to the usual methods of resuscitation.

In the first case the mother, a Chinese, had been in labor for two and a half days; when he was called to her the head of the child was presenting and was delivered by low forceps operation. The child was exceedingly pale and limp and made no attempt to breathe beyond one slight retraction of the abdomen. He used the various methods of artificial respiration with the child bathed in hot water, and also tried breathing into its mouth through two layers of gauze, but without any result. These measures had occupied about fifteen or twenty minutes, and the friends regarded the child as quite dead and advised him not to trouble further. However, as he could just detect a little heart flutter, he determined to give a small injection of pituitrin. He injected about .3 cc into the muscle of the buttock, and within less than a minute the child gave a deep sigh, the color began to flush its skin, and before five minutes it was crying and breathing quite normally. The friends almost regarded the case as one of raising the dead.

The second baby was also a Chinese; the mother had a perfectly normal labor without aid of any kind. The cord was round the neck rather tightly when the head was born, but it was immediately released. The babe gave a few gasps, but it was quite evident that no expansion of the lung had taken place, for with the retraction of the abdomen the intercostal muscles seemed also to be drawn in, and the whole body was pale, flaccid and lifeless. He performed the usual methods of artificial respiration, and kept the child in warm water while doing so, until the placenta was expelled, before he cut the cord, and continued these efforts for quite quarter of an hour. As he felt the heart was still beating, he thought he would try, as in the former case, the effect of pituitrin, giving about .3 cc. The result was most striking. The child gave a deep sigh, the lungs expanded, and in a minute or so the body, which had been so pale, became deeply flushed, while the stump of cord which a moment before was lying limp, flat and bloodless on the abdomen of the child, began to expand and throb quite strongly with the force of the blood that filled it.

The explanation that occurred to him at the moment was that the pale asphyxia was due probably to something of the nature of "shock," and the action of the pituitrin in contracting the arteries and raising the blood-pressure forced a larger supply to the lungs and at the same time stimulated the intercostal and abdominal muscles to contract. He would be glad if others who have had any similar experiences would venture an explanation.

He confesses that when he first used pituitrin in this manner it was largely in the hope that something might come from a stimulant that could act quickly that led him to make the attempt, and he intends to repeat this method again in like circumstances.

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### Meningitis Treated by Lumbar Puncture.

SHAW, in the *Archives of Pediatrics* for January, 1924, states that the case which he reports was undoubtedly one of diffuse purulent meningitis secondary to an abscess resulting from a middle-ear infection.

Braun has shown that this infection may extend from the labyrinth through the ductus endolymphaticus into the saccus endolymphaticus, a small sac situated between two layers of the dura overlying the posterior surface of the petrous pyramid. This is the seat of the abscess which probably broke and gave rise to the leptomeningitis.

The prognosis of so-called otitis meningitis is very unfavorable. Breiger, who collected 71 cases, found only six recoveries, and only one of these cases complicated acute otitis and five chronic otitis. Many authorities favor radical surgery by performing a mastoid operation or a labyrinthectomy to facilitate drainage.

Haynes, in an article on the surgical treatment of meningitis, states that lumbar puncture as a therapeutic agent is inefficient except in serous non-purulent

meningitis. Naffziger on the other hand finds that repeated lumbar punctures with withdrawal of considerable amount of fluid are of definite value therapeutically, and Braun cautiously states that repeated lumbar punctures sometimes have a favorable effect on meningitis.

The drainage of purulent material is necessary in all pyogenic infections to reduce the amount of toxic material which otherwise would be absorbed. In the case reported chloroform anesthesia was advisable as it prevented the struggles and terror of the child and simplified the procedure for all concerned. As much fluid should be removed as possible, and Shaw's rule is to remove the needle when only one drop in three seconds appeared.

Lumbar puncture under anesthesia as often as seemed necessary was the only therapeutic agent employed in a case of purulent meningitis due to the streptococcus hemolyticus, which made a complete recovery in eight weeks.

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### The Blood-sugar Concentration in the Liver Vein, the Leg Artery and the Leg Vein During Insulin Action.

CORI, CORI and GOLTZ, in the *Journal of Pharmacology and Experimental Therapeutics* for December, 1923, state that simultaneous analysis of the blood of the liver vein, the femoral artery and the femoral vein showed that the factors causing the fall of the blood sugar during insulin action are:

1. A diminished output of sugar by the liver into the blood stream.

2. A larger intake of sugar than normal by the muscle from the blood stream.

3. Insulin may cause a fall of blood sugar in three ways: (*a*) By its action on the liver (diminished output of sugar). (*b*) By its action on the muscle (increased intake of sugar). (*c*) By its combined action on both the liver and the muscle, the former showing diminished output and the latter simultaneously increased intake of sugar.

### The Parkinsonian Syndrome.

CRITCHLEY, in the *Bristol Medico-Chirurgical Journal* for January, 1924, reminds us that while no specific treatment is known for this disease, or indeed any form of therapy that can be regarded as curative, nevertheless there is no excuse for withholding measures which, if correctly applied, afford the patient a vast amount of relief. Energetic treatment directed toward the various symptoms has the power of alleviating much of the patient's discomfort, and, possibly, of checking the progress of the disease in the senile cases. The main features that will call for relief are the rigidity, the tremor, the bulbar symptoms, insomnia, and the uncomfortable sensation of heat.

First, the patient should not be confined to bed, except in the very last stages of the disease. He should be encouraged to exercise and mix freely with others. This serves the double purpose of combating the rigidity and of maintaining the spirits. Confinement to bed hall-marks the patient as an invalid, and may have a disastrous effect upon his morale.

Light, general massage is sometimes of service. It must be given, however, with circumspection, as many patients are extremely intolerant of massage and become profoundly exhausted after each treatment.

Passive movements of the arms and legs are valuable in allaying rigidity and preventing contractures and fixed joints.

Regulated exercises should be ordered and carefully supervised so as to avoid excessive fatigue. Relaxation exercises are of especial value when correctly carried out, and afford the patient a deal of refreshment and comfort.

Galvanism, faradism, sinusoidal baths, and other forms of electrical treatment are not to be recommended.

Perhaps the most valuable form of therapy, however, lies in the daily administration of hot baths. The patient lies for twenty to thirty minutes in water as hot as he can bear, and at the same time

voluntarily relaxes all his muscles. The effect in decreasing the hypertonus is immediate; patients have told him that they have at once been able to dry themselves, when previously their rigidity prevented all but the slightest movement. The benefit in cases of insomnia is also very great.

Among the most valuable drugs for this complaint are hyoscine, parathyroid extract, veratrum viride, gelsemium, luminal, the bromides, and belladonna.

Hyoscine is probably the most useful drug of all, when administered in suitable doses. As a rule it is given in much too small amounts, and consequently the results have been disappointing. Improper use has therefore brought discredit upon a valuable drug, as has happened so frequently in modern medicine. The main effect of hyoscine in this disease is upon the rigidity, which shows a very rapid response. It moreover checks the excessive salivation and the hyperhidrosis. The effect on the tremor is practically *nil;* in fact, there may be a temporary increase in the tremor at first, owing to the release of the hypertonus. Hyoscine, therefore, is best prescribed in combination with the bromides, parathyroid, veratrum viride, or some other sedative drug. Hyoscine hydrobromide, gr. 1/100 to 1/50, is not too large a dose when given by the mouth, and may be repeated two or three times daily.

In obstinate or advanced cases of rigidity it may be necessary to administer hyoscine hypodermically. Thus gr. 1/200 to 1/100 injected at bedtime, and again in the morning if necessary, relieves the patient enormously.

Parathyroid extract has been in use in this disease since 1905. The results, however, have been conflicting, due chiefly, he believes, to improper preparations of the gland and also to its inability to improve the rigidity. Nowadays, when one is able to standardize preparations of parathyroid extract, one is forced to admit that it is a drug of value in this disease. Its chief action is a sedative effect on the tremor, combined with a most marked benefit to the patient's comfort and sense of well-being. Patients who have been on parathyroid and then taken off have begged him to put them back again, as they felt so much better when on the drug. There is an appreciable improvement in the appetite, and many patients gain in weight. It is a very valuable adjuvant to treatment with hyoscine.

The bulbar manifestations seem to be particularly amenable to parathyroid medication. Three cases in his series, all showing marked bulbar phenomena (dysphagia, deviation or inability to protrude the tongue, etc.), completely lost these symptoms after a week's treatment with parathyroid. No other drugs were simultaneously employed.

The bromides are of value in allaying tremor and in some measure they relieve insomnia. Their action in this connection is so mild, however, that doses must be employed sufficient to cause depression.

Gelsemium has been tried, particularly in the postencephalitic cases, but the results have been disappointing.

Another old-fashioned drug, which he has thought benefited patients is veratrum viride, given cautiously in three- to four-minim doses of the tincture. The chief action was upon the tremor.

Phosphorus was formerly an extremely popular drug in this disease, but its use seems to have dropped out of fashion. He has employed it lately in the form of the pill of phosphorus, gr. 2-4 t. d. s., with but little benefit to the tremor or rigidity. There was a definite general improvement, however, in the patient's malaise and discomfort.

Belladonna may be required to augment the action of hyoscine in cases of profuse salivation.

Strychnine should generally be avoided in paralysis agitans, as it tends to increase the rigidity. As a temporary measure, however, it may be required in cases of extreme bulbar involvement endangering life.

Insomnia when present in this disease is due to inability to relax completely. Ex-

cessive tremor or involuntary flexion spasms may also aggravate the sleeplessness. For such conditions veronal or its derivatives are the best hypnotics. Either veronal gr. 5-7 (diethyl-barbituric acid), or medinal gr. 5-7 (sodium diethyl-barbituric acid), luminal gr. 1-2 (phenyl-ethyl barbituric acid), or dial gr. 1½ (diallyl-barbituric acid) may be administered nightly. These drugs are all very rapid in action; they afford a refreshing sleep, and produce no untoward effects.

A word of warning must be said against lightly undertaking operative measures upon patients with Parkinson's disease, especially the post-encephalitic cases. One is often tempted to improve deforming contractures around the joints by simple tenotomies or forceful manipulations. The operation, however, appears to be followed by a profound exacerbation of the disease, and the patient is usually left in a much worse condition than before.

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### The Treatment of Acute Osteomyelitis.

In the *California State Journal of Medicine* for January, 1924, OCHSNER states that in every patient suffering from pain in any bone, the latter should be carefully palpated at once.

Pain upon pressure over a bone indicates the presence of osteomyelitis or periostitis.

The earlier this is demonstrated the less destruction will occur if operated upon immediately.

The operation should consist in splitting the overlying tissues down to the bone through the periosteum.

The incision should extend beyond the painful area above and below.

The periosteum should be loosened to 1 or 2 cm. on each side of the incision.

As a rule, this should be the extent of the primary operation.

In rare cases of very circumscribed infection, the infectious area may be very carefully excised, care being taken not to spread the infection by rough handling of gouge, which should be very sharp.

Hot, moist dressings with electric light treatment hastens recovery.

The shaft of long bones should never be removed until involucrum has been formed.

The primary focus of infection should always be determined if possible.

As soon as the patient has recovered from the acute operation, the primary focus of infection should be removed if possible.

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### Roentgen-ray Therapy in Thyrotoxicosis: Its Effect as Measured by the Basal Metabolic Rate.

READ, in the *California State Journal of Medicine* for January, 1924, states that the Roentgen ray seems to be effective in reducing the metabolic rate, together with the toxic signs and symptoms in thyrotoxic patients.

Determination of the basal metabolic rate affords the best check on the result of therapy and should be made routine in treatment with *x*-ray.

A period of three to six months is necessary to secure marked improvement or return to normal. The higher the initial rate the longer must be the period of treatment.

No patients are made worse by irradiation and no myxedemas resulted in his experience therefrom.

No deaths have occurred in this series of fifty cases in patients treated with *x*-ray alone.

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### The Acute Mental Case.

YELLOWLEES, in the *Lancet* of January 12, 1924, states that the constant and exhausting restlessness in acute confusion or delirium may sometimes be quieted by tepid sponging, and a cold pack sometimes works like a charm. Frequently, however, the restlessness is so intense and noisy that sedative drugs must be given. This should never be unduly delayed. Such drugs wisely used are a direct means of combating the intense and frequently fatal exhaustion which the sustained restlessness and struggling is doing much to hasten. Paral-

dehyde is by far the safest and best. It can be given in doses of half an ounce with perfect safety, and repeated *ad lib.* In a really acute case, however, it may fail to act for more than a very short time, if at all, and recourse must be had to more powerful agents, of which a mixture of morphine (gr. ¼) and hyoscine (gr. 1/75) is probably the best.

Most important of all is the question of food, and it is here that the course of the case lies so largely in the nurse's hands. Not only are the patient's digestive functions more or less in abeyance, but complete refusal of food is a usual characteristic of these cases. Any form of liquid nourishment which the patient can be induced to take is permissible. It should, of course, be given often and in small quantities, and a food chart must be kept on which the amount and nature of the food, and the time of its administration, are noted. The patient is usually far too ill to show any preference for one variety of nourishment rather than another, but may sometimes do so in obedience to hallucinations, or perhaps during a brief lull in his condition. Any such preference should at once be regarded.

If the refusal of food is absolute and continued for a day, tube feeding must be resorted to without hesitation. This is an infinitely simpler proceeding than is often imagined, and may be carried out with perfect safety and confidence by any practitioner. The nasal method is easiest and best. The tube should be about the size of a No. 15 catheter, and is joined by a small glass connection to another rubber tube and glass funnel. The rounded distal end slightly lubricated with oil or glycerin is passed quietly and steadily along the floor of the nose. It will be found that one nostril is almost always very much easier than the other for this purpose. When the tube goes down into the back of the throat it is still moved gently and slowly onward until a swallowing reflex is evoked and one can feel that it is within the grasp of the pharynx. It can then be pushed boldly onward. Occasionally, owing to very rapid insertion or undue softness of the tube, it curves forward into the mouth instead of passing into the esophagus, in which case it must be withdrawn and another more gentle attempt made. The only possible danger is the entrance of the tube into the larynx, and this is so exceedingly rare and produces such obvious signs when it occurs, that it need be no ground for hesitation or alarm.

The proceeding is by no means painful, but a delirious patient usually has to be carefully held and controlled while it is carried out. There are many methods of doing this, a simple and effective one being as follows: The patient being on his back, one assistant lies across the bed, his chest coming over the patient's thighs well above his knees. With his hands, which are both free, this assistant holds the hand of the patient which is furthest from him. The second assistant holds the other hand, while a third controls the head, with the aid of a broad towel round the patient's forehead, if necessary. By this means the most violent patient can be controlled with perfect ease, and without possibility of harming him; but in many cases two assistants are amply sufficient.

After the tube has been passed, it is wise to introduce first of all a small quantity of water through the funnel to satisfy oneself that the tube has been properly passed into the stomach and that the passage is clear. Milk, custard, and liquid foods of all kinds can be administered in this way, as well as any necessary aperient or hypnotic drug. Sugar and fruit juice are useful additions to a feed. Unfortunately, delirious cases show a remarkable tendency to vomit the food given almost as it enters the stomach. Deftness in introducing the tube and rapidity in withdrawing it will do much to prevent this, but it is a constant and troublesome complication. On more than one occasion during the war, when facilities for dealing with such cases were not good, he had to resort to administering a general anesthetic after the introduction of the tube, and giving the food and withdrawing the tube while the patient was anesthetized.

This, however, is a last resource, which is not to be recommended. The giving of small quantities greatly lessens the risk of vomiting and a preliminary wash-out of the stomach is often of help. As the most intense phase of the delirium passes, the patient can generally be induced to take sufficient food of his own accord. Improvement is rapid, though the confusion tends to come and go in waves before it finally disappears. The further treatment is that of convalescence from acute, exhausting, and dangerous illness.

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**Treatment of Pulpitis.**

In the *Lancet* of January 5, 1924, PITTS states that if there is a large accessible cavity, the superficial débris should be removed with an excavator, the cavity should be dried, and a small pledget of wool dipped in pure phenol or oil of cloves placed therein. A convenient preparation of phenol is carbolized resin. This consists of pure carbolic acid, 4 parts; resin, 4 parts; and chloroform, 3 parts. The mixture forms a viscid fluid. A small piece of wool should be dipped in this and placed in the tooth, and should be protected from the saliva by a water-tight dressing. The use of gutta-percha is not advisable, except by an expert, for it must be used hot and packed in under pressure, and may thus increase the pain instead of relieving it. A convenient dressing is wool dipped in gum mastic or gum sandarac. This sets hard enough to last several days. In addition, the gum should be painted with tincture of iodine to aid in depleting the vessels of the pulp. Equal parts of the weak and strong tinctures of iodine form the best preparation.

Counter-irritation is only an adjuvant in the treatment of pulpitis. Success cannot be guaranteed, but providing the inflammation has not gone on to the stage of suppuration and that the right tooth has been treated, the pain will in many cases be relieved for a few days. If these measures fail anodyne drugs may give relief; tincture of gelsemium, 10-minim doses, may be combined with potassium bromide, 10 grains, but drug treatment represents a less desirable and less certain means of relieving pain.

In cases of periodontitis the pulp is dead, and it is useless, and indeed harmful, to place a dressing in the cavity of the tooth. Any possibility of drainage through the pulp canal would thereby be made impossible. A piece of wool placed in the cavity during mealtimes and removed afterwards, is useful in preventing food from being jammed in the pulp canal. The only possible treatment is counter-irritation applied to the gum. Tincture of iodine, to which some tincture of aconite has been added, is the best drug. The gum should be dried and the excess of iodine squeezed out of the wool before applying. Penetration of the drug is increased if a current of warm air is directed on the gum. The strong tincture may be used, but should not be applied more than once. In subacute periodontitis counter-irritation is often efficacious, unless suppuration has supervened. A hot mouth-wash should be used frequently, the heat being more important than the ingredients, though weak carbolic is perhaps the best. A smart saline purge may help in the early stages. In severe periodontitis extraction is often the best treatment. Since such teeth are loose and their extraction may not be difficult, the medical practitioner need have the less hesitation in attempting their removal. A local anesthetic should never be used in acute periodontitis, for the injection of fluid into the inflamed gum may result in severe after-pain and even necrosis.

Toney records a case in which severe toothache was relieved by cocainization of the sphenopalatine ganglion. A drop of saturated aqueous solution of cocaine was applied to the mucous membrane just posterior to the posterior tip of the middle turbinate bone. The pain ceased in five minutes. In obstinate cases of toothache, which cannot be relieved by other ways, the method might be worth a trial.

The aid of the medical practitioner may be sought to relieve the pain following the extraction of a tooth. If there has been

laceration of the gum or splintering of bone the pain may be severe. The best way to relieve it is by irrigation of the socket. A syringe with a narrow nozzle and of about an ounce capacity should be used. The best lotion is carbolic, 1 in 100, as hot as the patient can tolerate. The socket should be gently flushed out several times, and the lotion used frequently as a mouth-wash. This will give great relief in a short time. If the pain is very acute, and there is a history of the tooth having been fractured, the pain is often due to the end of the pulp projecting from the broken root. Relief will be given by drying the socket and swabbing it out with pure phenol, or instilling powdered orthoform.

It must be emphasized that the palliation of toothache cannot always be promised by measures short of those only available to the dentist. But the attempt to relieve pain is always worth making, and if a correct diagnosis has been made the attempt will often be successful.

# Surgical and Genito-Urinary Therapeutics

### Deformities of the Os Calcis.

OPENSHAW *(British Medical Journal,* Dec. 22, 1923) mentions seven deformities of the os calcis, three of them traumatic, two congenital, and two incident to disease.

Of the traumatic group the oblique fracture of the os calcis is first considered. The posterior part of the os calcis may be split off by an oblique fracture running from behind the articular surface downward and forward to the under surface. It is important accurately to diagnose the exact line of this fracture, and to obtain exact apposition of the fragments, as otherwise the posterior end of the under surface of the anterior fragment is apt to form a projection into the sole, which will compress the plantar digital nerves, and render walking difficult. The posterior fragment of the os calcis is pulled upward by the tendo Achillis. Unless the tendo Achillis is fully relaxed by bending the knee and putting the foot in the equinus position it is very difficult to replace the fragments and retain the posterior fragment in accurate position. If this is not done the line of union of the bone is weak and is liable to be painful when stretched and walked upon.

Compression fractures such as result from jumping from a height and alighting on the heels diminish the distance between the upper and lower surface of the bone. There is compression from above downward, but at the same time the bone is expanded laterally. It is this lateral expansion of the bone which may give rise to permanent symptoms of pain and discomfort. There are, of course, in such a fracture, as in every fracture of the os calcis, the usual signs of severe injury—pain, swelling, inability to stand or walk, ecchymosis, venous discoloration of the skin, pain on movement, and a deformity which sometimes can be perceived by the finger or by measurement.

After some weeks the immediate effects of the injury may have passed off, and the patient may be able to walk, but where the bone has definitely undergone lateral expansion he cannot walk long distances. He experiences a severe pain situated in front of the external malleolus.

There is a type of fracture involving the os calcis and tarsus in which there is extensive comminution; such results from a perforating bullet wound. The under surface of the os calcis will often in these circumstances present an irregular mass of bone, rendering the sole of the foot convex instead of concave. After the necrosed fragments have been removed, the sinuses have healed, and the inflammation has subsided, there may still remain an irregular mass of bone projecting into the sole of the

foot, rendering progression impossible. So long as this mass of bone is allowed to remain it will compress the digital nerves at every step taken. These cases have been perfectly cured by the following operation:

An equilateral triangular flap of skin and subcutaneous tissue, whose base is half an inch from the outer border of the foot, and whose apex is at the head of the astragalus, is elevated and turned outward. The plantar fascia and intramuscular septa are exposed. The posterior attachment of the plantar fascia is divided at the os calcis and is drawn inward. The under surface of the os calcis is reached through the external intramuscular septum. The periosteum is elevated from the under surface of the os calcis by means of a rougine. The flexor accessorius and deep flexor tendons being pushed inward, the irregular mass of new bone is thereby fully exposed. It is chiseled away, and the concavity of the under surface of the os calcis is restored. The periosteal flap is replaced, the plantar fascia is sutured in position, and the triangular skin flap is replaced and sutured. By this method of operating the whole of the under surface of the os calcis can be thoroughly explored, and any irregular mass of bone which projects into the sole of the foot can be removed without damage to any nerve, vessel, or tendon. The wound heals by first intention and no discomfort results afterward. In fact, a perfect cure is effected of the previous disability, for which amputation seemed to be the only remedy.

Concerning congenital defects there is an overgrowth of the great process of the os calcis in every severe case of equino-varus. The clinical effects of this bony hypertrophy are such that even after the plantar fascia and the abductor hallucis have been removed, the intramuscular septum has been carefully dissected out, the internal lateral ligament has been divided, and the foot has been wrenched outward, the outer border of the foot will still remain convex, and cannot be made to approximate a straight line. In every such case in which the outer border of the foot cannot be made straight or concave, the great process of the os calcis will be found hypertrophied, and must be removed. This is best performed by an incision over the dorsal surface of the calcaneo-cuboid joint, about three-quarters of an inch in length, and below the level of the peroneus brevis tendon and external cutaneous nerve. The joint is opened, the dorsal ligament and the origin of the extensor brevis digitorum are detached from the dorsal surface of the bone for an appropriate distance backward, usually from half to three-quarters of an inch, a chisel is inserted, and the projecting portion of the os calcis is divided, elevated, and removed.

Even in severe cases of talipes equino-varus the foot can be completely rectified by removal of half an inch of the os calcis. If when this amount of bone has been removed the outer border of the foot should still not be straight, more of the os calcis should be removed, even up to one inch. Should the outer border of the foot still not be straight, a portion of the cuboid should be removed.

Overgrowth of the outer wall of the os calcis is at times associated with an ankylosis between the astragalus and the sustentaculum tali. It is only met with in the most severe cases of long-standing congenital equino-varus, and is the direct result of long continuance of the foot in the deformed position. In such cases the os calcis undergoes inward rotation on an anteroposterior axis, and to rectify this tilting it is necessary to open the astragalo-calcaneo joint, and to remove a portion of the upper and outer surface of the os calcis. It may be necessary to divide the ankylosis which may have taken place between the astragalus and the sustentaculum tali. When this ankylosis is divided, and an appropriate piece of the upper part of the outer surface has been removed, the os calcis can then be rotated outward and placed in its normal vertical position.

The development of spurs on the inner surface of the os calcis may lead to considerable difficulty in walking. These tubercles give attachment to the abductor

minimi digiti and flexor brevis digitorum muscles. When these spurs cause disability they should be removed by operation. An incision should be made on the outer aspect of the heel, one and a half inches forward along the outer border of the foot, and extending backward round the posterior part of the os calcis. By this incision the whole of the posterior half of the inferior surface of the os calcis can be exposed without damaging any vessel or any nerve.

Overgrowth of the epiphysis, that is the posterior part of the os calcis, is becoming increasingly frequent because of the violent athletic exercises indulged in at an early age. The osteophytic outgrowth may be so prominent that not only is it difficult to make the patient's boots fit comfortably, but as the result of excessive pressure and friction a bursa may be developed, which is liable to become inflamed, enlarged, and tender after a spell of exercise, even when that exercise has been of short duration.

When this epiphyseal enlargement causes such an amount of inconvenience as to materially interfere with the comfort of the patient or his ability to undertake ordinary walking exercise, the osteophytic outgrowth should be removed. The incision should be semilunar in shape, almost vertical, and placed over the outer surface of the os calcis. This incision extends down to the bone, the periosteal flap is elevated and turned backward, and the projecting mass of the os calcis is exposed and removed. The periosteum is then replaced, the wound is sutured, and a small tube inserted.

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### Coccygodynia.

ODELL (*Clifton Medical Bulletin*, December, 1923) observes that the most common symptom of this affection is pain in the region of the coccyx. Practically all writers agree that this pain is usually sharp, aching, and paroxysmal, though occasionally it may be constant. This pain is definitely produced or is made worse by any movement which produces a strain on the muscles attached to the coccyx, as in defecation; or by pressure from sitting or reclining. Fifty per cent of the cases had the pain greatly increased by the sitting posture This pain may be so severe and long continued as to produce the so-called neurasthenic state. An occasional writer even goes so far as to say that neurasthenia is the cause of this state, while Oppenheim in discussing the condition makes a statement to the effect that all cases seen by him up to 1911 were associated with hysteria or psychasthenia.

No physical examination is complete without careful bimanual examination, or rather bifinger examination with a gloved index-finger in the rectum and the thumb over the coccyx. The mobility of the coccyx should first be determined, then tenderness and its point of maximum intensity, as well as any abnormalities at the anterior border of the sacrococcygeal articulation. The shape of the coccyx and its position can be learned only by such examination, as can the question of mobility of the bone.

The earlier investigators always advised excision of the coccyx. This was found by experience to give satisfactory results only if the lesion was in the bone or articulation. If the pain was reflex or neuralgic, nothing was gained by this procedure.

To De Vesian of Paris, writing in 1907 on this subject, belongs the credit for first reporting the use of alcohol injections. Young, in 1910, also advised this method of treatment, but seemingly only to get the patient in condition for resection, which he advised as giving the best hope for permanent cure. Both Duffy and Yeomans, working separately and publishing their results in 1914, advocate strongly the use of alcohol injections, differing in opinion only as to the site of the injection. After infiltrating the skin with novocaine and adrenalin solution, with a long needle, using the finger in the rectum as a guide, Duffy injects 4 cc of 80-per-cent alcohol along the anterior surface of the sacrococcygeal articulation. Yeomans places his patient in the left lateral (Sims) position. After painting the region of the coccyx

with tincture of iodine, the index-finger is inserted in the rectum and the point of maximum tenderness is determined by counter-pressure externally by the thumb. The finger is kept in the rectum to prevent its puncture and to act as a guide. A fine-gauge two-inch needle attached to a sterile syringe is introduced through the midline to the painful spot. When the point of the needle reaches the point of maximum intensity, the patient will exclaim from pain. Then an injection of 10 to 20 minims of 80-per-cent alcohol is made. Both Duffy and Yeomans agree that the injection may be needed more than once, occasionally four to five times, but that the results had been quite satisfactory.

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### The Treatment of Gonorrheal Endocervicitis by Heat.

Corbus and O'Conor (*Surgery, Gynecology and Obstetrics*, January, 1924) note that the corporeal endometrium tends to remain free from chronic infection. Histologic examinations and cultures from cervices obtained at operation have revealed that bacteria frequently lodge in these tissues; especially in the vicinity of the actively secreting glands of the mucosa. It has been found, also, that granulations and strictures are often present in the canal of the cervix. It has rarely been possible to obtain gonococci in cultures from thoroughly ground Fallopian tubes removed from patients who have been free from fever and leucocytosis for a period of ten days or two weeks. The Fallopian tube, therefore, can hardly be considered as a focus for perpetuating a chronic gonorrheal infection of the cervix. Persistently active gonorrhea of the tubes is evidently ascribed either to recurrence of infection from without or repeated invasion of bacteria from the chronically infected lower genital tract.

If the patient can be early isolated from the source of the infection, a single attack of gonorrheal salpingitis is usually borne without protracted clinical symptoms or severe pathological results. In a series of three hundred patients with evidence obtained by the histories, examination of the external genitalia, and operative findings combined with laboratory studies, it was ascertained that the gonococcus was responsible for 70 per cent of the cases.

Further investigation, comprising a combined bacteriological and histological study of the endometrium in health and disease, has shown that chronic endometritis, with bacteria present in smears or cultures, is practically to be ruled out as a clinical entity.

The gonococcus is most frequently found, because it is the infectious organism most often brought in contact with the cervix. Since chronic infections of the corpus uteri are as a rule secondary to infections in other pelvic organs, intrauterine treatment has little value, because the focus of infection is not within reach but persistently comes from the endocervical glands. It is here that treatment must be directed, as the gonococcus localizes in the glands of the cervix and endocervix and is the predisposing cause of a chronic purulent discharge in a large percentage of women who have not borne children, and the predisposing cause many times of leucorrhea in women who have borne children. Any method of endocervical treatment which will destroy the gonococcus and at the same time cause only a minimum impairment of tissue should be an ideal way of curing this troublesome and chronic infection.

In order to determine the effect of different degrees of heat on the mucous membrane, Santos inserted the positive electrode into the urethra of dogs and heated the instrument to 113° F. (45° C.) for one hour. No distress was apparent during the entire treatment. The dogs were sacrificed after eight days, and grossly the urethra showed no abnormality. In comparing the heated and unheated segments microscopically there was merely an epithelial desquamation in the heated portion.

Santos further experimented on himself and others. He states that up to 109° F.

(43° C.) nothing abnormal is felt within the urethra, but starting at 109.4° F. (43° C.) there is a gradual sensation of warmth, and this is increased to a point of intolerance at 114.8° F. (46° C.). He has kept the urethra heated to 113° F. (45° C.) for one hour without the slightest tissue destruction.

We must accept the fact that gonorrhea persists in women largely because of the continued presence of the gonococcus in the paraurethral, the cervical, and the endocervical glands. Frequently the continued application of locally effective germicidal agents will bring about a complete disappearance of the gonococci in these structures. But in a great many women treated by douches and local applications the gonococci remain securely in the depths of the endocervical glandular tissue. A germicidal agent is therefore needed which will penetrate to the active foci. From the foregoing it must be clear that heat constitutes the most ideal gonococcicide, provided it can be carried into the depths of the tissue and so controlled that it will destroy the infection and leave the normal tissue unharmed.

The gonococcus is instantly destroyed at a temperature of 113° F. (45° C.). Also prolonged exposures of somewhat lesser degree gradually bring about its disintegration. It is possible to maintain a temperature of 116° to 117° F. (45.5° to 47.5° C.) within the cervix for forty minutes without causing pain, discomfort, or tissue destruction.

With the advent of the more powerful high-frequency machines it has become possible to get heat into "the depths of the tissue" by diathermy. Geyser and Santos have reported unusually favorable results from the application of induced heat to the male urethra.

The thermophore consists of a very thin nickel-silver shell, closed at one end, and measuring 5 millimeters in diameter; a hard-rubber sheath, or covering, measuring 15 centimeters in length and 1 centimeter in diameter is attached, thus allowing an extension of 4 centimeters for insertion into the cervical or urethral canal.

An insulated terminal is provided for attachment of the cable supplying current. A thermometer is inserted to the full depth of the shell and readings are taken from the exposed portion.

It has been found that the greatest accuracy is necessary in constructing the instrument in order to insure the proper temperature regulation.

Any diathermy machine which is capable of supplying 800 to 1000 milliamperes will produce heat enough to supply the thermophore.

The patient is placed in the lithotomy position. It is well, but not entirely necessary, to have the table covered by a rubber pad. The indifferent electrode, 4 to 6 inches in size, is made of block tin. This is placed over the suprapubic region with a gauze pad saturated with hypertonic salt solution imposed between the electrode and the skin. The gauze must be kept moist during the entire treatment. A vaginal speculum having been inserted, all mucus, pus, and débris is removed from the cervical canal and vagina by alkaline swabs. The active electrode (cervical thermophore) is then placed in the cervical canal and anchored to the speculum to insure its being held in place. The contacts are made and the current gradually turned on. Care should be used in watching the rise of temperature as indicated by the thermometer. The thermophore should be kept under constant observation during the entire treatment.

When the thermometer registers 116° to 117° F. (46.5° to 47° C.) the current is stabilized, and this degree of heat is continued for thirty to forty minutes. The treatments are repeated every week or ten days. They are absolutely painless, as evidenced by the fact that many fall asleep during the séance.

Following this treatment, the cervical discharge changes very rapidly from a thick purulent to a thin watery character, and cervical erosions rapidly heal. In the interim between treatments a wire vaginal bath speculum is inserted by the patient herself two or three times a week. She then remains in a hot bath for one-half

hour. The heat of the water should be gradually increased from 100° to 110° F. (37.78° to 40° C.).

Infection of Skene's or other urethral glands calls for separate consideration. It must be distinctly understood that this form of treatment in no manner replaces surgery, where surgery is indicated. Bartholin gland abscesses, fistulæ, salpingitis or pelvic abscess call for the usual surgical consideration.

Thirty-five women have been treated by this method. Of this number eighteen have been observed repeatedly during the past three years. Twenty-two have been checked for two years. The remainder disappeared after the cessation of active treatment and were not available for observation after the three-month period following the application of their discharge technique.

The routine has been to study microscopically the cervical discharge coincident with each heat application. The treatments are continued until the gonococcus has been absent from five successive smears. The patient is then instructed to return twice monthly for examination of the cervix and urethra. One of these examinations is made forty-eight hours after the cessation of the menses. If no gonococci are found during the first two months an endocervical application of 5-per-cent silver nitrate solution is made and smears obtained twice during the week that follows. If these are negative, the patient is declared well.

It should be emphasized that three negative cervical smears taken in quick succession after cessation of a given method of treatment do not justify the assumption of a permanent cure.

In twenty-two carefully studied cases the gonococcus disappeared permanently from the cervical discharge as follows: After one treatment, five cases; after two treatments, seven cases; after three treatments, four cases; after four treatments, two cases; after seven treatments, four cases. The fewest treatments given in any individual case were four, and the most fourteen.

Four of these twenty-two women have married, borne children, and yet showed no sign of recurrence.

This method is contraindicated during pregnancy, in the early stages of the infection, or when evident active pelvic inflammatory changes such as salpingitis or pelvic cellulitis are present.

The most pertinent point about this method of treatment lies in the fact that its application entails painstaking coöperation between patient and physician, slightly more prolonged office treatment than is usual, and sufficient intelligence on the part of the patient to realize the importance of getting completely well.

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### The Type of Mattress Useful in Case of Renal Incompetence.

Montague *(Surgery, Gynecology and Obstetrics,* January, 1924) states that in size and general appearance the mattress devised resembles an ordinary single-bed mattress. This fact increases the range of utility, for it may be used on any bed or any spring. It differs, however, from the ordinary mattress in possessing a recess built into the center of the mattress from the side to accommodate an excretory receptacle. This recess is filled by such a receptacle and a mattress section, or by two mattress sections, depending on whether the use of one or the other is required; these being pushed in from the side. With the two sections in place the mattress may be used as an ordinary one. When the receptacle is in use the recess and the mattress for about one foot around is covered with rubber cloth. This is done to protect the mattress in case of accidental spilling of excreta, though this, with ordinary care, seldom occurs. The patient is made absolutely comfortable by lying on a rubber ring, cushion or pneumatic horseshoe which is placed on the bed-pan or douche-pan. The latter has appeared preferable in many instances.

When one wishes to change the pan and replace it with a clean one the patient merely half turns and the outer section is withdrawn. The soiled pan is then replaced

by a clean one which is held ready. When the outer section is replaced, the patient is allowed to roll back. In a few seconds, therefore, without the slightest exertion on the part of the nurse, the bed-pan may be changed under the heaviest of patients.

In cases not incontinent this type of mattress, because of the depressed position of the pan, allows natural excretory function without disturbance to the patient. This, for instance, in case of pneumonia is a matter of prime importance, because the strain attendant upon the use of a bed-pan on the level type of mattress throws a decided and undesired strain upon the heart, with danger of producing dilatation.

The use of the mattress devised has proven most efficient in every respect. It is infinitely more comfortable and cleanly for the patient, and evacuations are a matter of comfort and ease. From the standpoint of the nurse, the ease with which cleanliness is maintained and the patient's excretory wants attended to, the device is particularly attractive. Linen is not soiled as quickly, nor are the frequent changes of linen required as with the ordinary type. This economy of time and effort of the nurse leaves her free for the performance of other duties.

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**One Thousand Cases of Abortion.**

HILLIS (*Surgery, Gynecology and Obstetrics,* January, 1924) notes that the gross mortality of his series was 2 per cent (20 of 1000). There were 297 cases admitted to the hospital with a temperature of 100° or above. Twenty of these died. No patient died among those admitted with a temperature below 100°. There were 12 febrile patients curetted, with three deaths; and 229 afebrile patients curetted, with no mortality.

Of the 20 fatal cases, 14 showed unmistakable signs of extension of the infection beyond the uterus at the time of entrance; nine had a general peritonitis; one a local peritonitis; three a septicemia; and one a pneumonia. In these cases the abortion itself had become of secondary importance and the treatment was directed principally to the combating of the well-defined complications resulting from the abortion. In considering the results of a given plan of treatment of abortions, these cases might properly be excluded.

Of the remaining six cases, the uterus was emptied in the hospital in three on account of hemorrhage (two of these were criminal abortions); one was curetted before entrance; two were not curetted in the hospital and denied interference before admission. In only one case among those who died was it known that the patient was not subjected to some kind of intra-uterine manipulation either outside or in the hospital.

Sixteen of the 20 fatal cases were known to have been criminal abortions induced by a physician, midwife, or by the patient herself. The two cases which died and were treated expectantly, denied interference, and no evidence to the contrary was found. One case moribund could give no history and doubtful evidence of abortion was found post mortem.

Only three deaths occurred among patients in which the abortion may have been of spontaneous origin. In only one fatal case was the abortion known not to have been criminally induced. This patient died five days following an extensive operation for ventral hernia and one day after the curettage. This death was due to hemorrhage and shock and not to sepsis.

Most of the deaths were in patients who were admitted in such a condition that it was evident the septic process had extended widely beyond the uterus, and were therefore not curetted. For this reason the percentage mortality is one per cent greater in the cases with no local treatment. These figures in themselves on their face would seem to indicate that active treatment furnishes the best prognosis from every standpoint. Such a conclusion is seen to be false when the list of fatal cases is studied, 16 of which were criminal abortions.

The study of a thousand cases of abortion seems to indicate that—

Conservative treatment of abortion in febrile cases gives better results than active therapy.

Febrile patients who have a five-day afebrile period have a greater tendency to continue a normal temperature after curettage than those who are operated upon before the end of this period.

Afebrile patients with a five-day observation period have a greater tendency to remain with a normal temperature than do those who are curetted before the end of this rest period.

Approximately 6.2 per cent of patients must be emptied because of alarming hemorrhage.

A plan of procedure which embodies a conservative rest period of five days' normal temperature for febrile and afebrile patients and results in as low a mortality as quoted in this paper seems to be a rational method for the treatment of abortion.

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**Primary Non-gonorrheal Urethritis.**

Under annotations (*Lancet*, Dec. 1, 1923) appears the following summary of a paper by E. BJORLING:

He argues that when cases of primary, so-called "non-gonorrheal urethritis" are scrutinized and the history is carefully investigated, evidence can almost invariably be found pointing to a comparatively recent or old infection with gonorrhea. He has collected all the 18 cases of primary "non-gonorrheal urethritis" in the male that he has seen within the last few years, and he has come to the conclusion that in none could the diagnosis of gonorrhea be eliminated. He maintains that, now and then, a man may suffer from acute gonorrhea without knowing of its existence; he may not be conscious of it till an acute posterior urethritis sets in with its usual discomforts, and if he escapes this complication the attack may pass off and temporary recovery may occur without his knowing that he has suffered from gonorrhea.

Some years ago Waelsch described a urethritis which he regarded as non-gonorrheal, both because the bacteriological evidence was negative and no history of gonorrhea was forthcoming. Bjorling notes that the cases recorded by Waelsch presented many features characteristic of his own cases. In both groups the urethritis was remarkably refractory to treatment. This refractoriness can, to a certain extent, be explained by the assumption that the source of infection may be an undiagnosed case of gonorrhea with which the patient continues to be in contact.

Bjorling's paper is a sobering corrective to the attitude still adopted in some quarters, according to which, when gonococci disappear from the discharge, the disease is regarded as cured. There are, unfortunately, conflicting views on this point. According to some authorities the so-called post-gonorrheal catarrh—*i.e.*, urethritis persisting after an attack of gonorrhea, and without demonstrable gonococci—is not infectious. Bjorling and others regard this standard of recovery as far too lax, and his carefully annotated case records show that gonorrhea may run a curiously subterranean, latent or symptomless course, digging itself in unobtrusively, and troubling the patient only after a long interval. A further lesson of Bjorling's paper is that many an obscure case of urethritis can be traced to the gonococcus if the physician takes the trouble to examine.

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**Recognition of the Tonsillar Infections.**

LOTT (*Atlantic Medical Journal*, December, 1923) notes that in cases of focal infection there seems to be a great diversity of opinion as to the advisability of removing tonsils with the hope of relieving certain symptoms. There are some men who remove all tonsils and others who remove relatively but a few.

In cases suffering from arthritis, neuritis, nephritis, chorea, mental depression, neurasthenia, spondylitis, cardiac involvement, gastric and intestinal disturbances, regard-

less of the amount of tonsil present, there usually exists an inflammatory zone along the free margin of that portion of the anterior pillar covering the tonsil. A narrow dark band indicates a dominant streptococcic infection; a more diffuse lighter colored band is characteristic of a dominant staphylococcic invasion.

Some of these patients are greatly improved by the removal of their tonsils and others are not.

Patients were observed ranging in age from forty to sixty-eight years, the average age being fifty years, who had had arthritis and neuritis from one to fifteen years, ranging in severity from severe pains in one or two joints to total disability. The observations in these cases may be summed up as follows: Their tonsils all showed the narrow, darker band and were all on this indication tentatively diagnosticated streptococcic infection. This diagnosis was later, in every case, verified by the laboratory. They all made a complete recovery and were still well one year later, justifying the conclusion that the tonsillar infection was really the cause of their trouble. Only one of the 12 cases had never had a sore throat.

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### Selection of Patients in the Surgical Treatment of Pulmonary Tuberculosis.

LILIENTHAL *(American Journal of Surgery*, January, 1924) after speaking in warm commendation of artificial pneumothorax states that one of the most annoying complications that arise during the maintenance of the pneumothorax is the accumulation of fluid in the pleura. Because of pleural tuberculosis or on account of pyogenic infection this fluid may become purulent. In the pyogenic infections a true mixed empyema results with all the dangers which that condition entails. The pyogenic organisms can sometimes be eliminated by means of antiseptic washing through an aspiration needle, but when this proves unsuccessful and the patient grows weaker and more toxic, operative surgery must be invoked. When tuberculosis of the pleura is present, little cold abscesses of the chest wall frequently develop in the puncture tract. These may be numerous and close together, so that they coalesce, and collections of pus of considerable size may form in the thoracic wall, demanding operative drainage. They are not easy to cure. The infection may in part be avoided by injecting a few drops of 2-per-cent lysol solution or of 95-per-cent alcohol through the needle while it is *in situ* and just before withdrawing it. Some of the alcohol or lysol may even be thrown into the tissues as the needle is withdrawn.

Obstinate mixed infection of the pleural sac with fever and other septic phenomena demands drainage by thoracotomy. The operation is done under local anesthesia and consists merely in the resection of a short piece of the eighth or ninth rib, in the posterior axillary line, with incision of the pleura. There is seldom need for more than the removal of an inch and a half of the bone, but the periosteum must be taken with it to prevent a too rapid regeneration with deformity of the rib and frequently with osteomyelitis.

The case should then be treated by the Carrel-Dakin method until the growth of all pus-forming bacteria has been checked. The tuberculous pleuritis is more difficult to manage, however, and may demand surgical procedures of considerable severity.

The physician in the case must decide whether or not a reëxpansion is desirable, for this depends upon the degree of destruction which the organ has undergone and the character of the lesion. A lung honeycombed with tuberculous cavities, for example, should surely not be permitted to function again. In the case of the incurably damaged lung, which must on no account be permitted to expand, a thoracoplastic obliteration of the pleural cavity in full or in part must be brought about. This is aided by the deviation of the mediastinum toward the affected side with physiological emphysema of the sound lung and the ris-

ing of the diaphragm, perhaps increased by resection of the cervical portion of the phrenic nerve.

Regarding the cases in which artificial pneumothorax is not applicable, or if applied has not been successful for reasons other than those connected with pleural infection, there remains the thoracoplastic collapse with phrenic nerve resection. In cases characterized by the formation of periapical cavities, if the remainder of the lung be not affected beyond hope therapeutic pneumothorax is not always advisable nor is an extensive thoracoplasty.

Under these circumstances operations having for their end extrapleural compression, sometimes referred to as apicolysis, must be considered.

The operation consists of opening the bony thorax near its dome, either with or without the resection of a rib, and separating the costal pleura from this part of the chest wall. With the fingers, pressure can be made upon the pulmonary apex through this mobilized costal pleura and an extrapleural space gained, equal in size to the cavity in the lung. This space is aseptic, so that fat from the patient's buttocks or abdomen may be implanted and the soft thoracic wall sutured over all.

In cases of tuberculous pneumonitis with consolidation and cavitation, conditions may arise in which thoracoplasty appears to be the only feasible means for relief. For example, repeated and severe hemoptyses in a case of this kind may threaten life, and yet such a lung cannot quickly be collapsed by gas because of the massive infiltration. With the opposite lung in fair condition it seems as if something should be done almost as an emergency measure to place the parts at rest and check the tendency to bleeding. When there is reasonably collapsible pulmonary tissue the first thing to do is to attempt the induction of a pneumothorax. If then it becomes clear that sufficient collapse cannot thus be obtained a phrenic nerve resection under local anesthesia should be made. This operation is a minor procedure so far as its danger to life is concerned, and the relief is sometimes immediate and great, the hemoptyses ceasing and the temperature falling. Examination by the *x*-ray following the resection will show an elevation of diaphragmatic dome with slight motions of paradoxic respiration. In a few days the first step of collapsing thoracoplasty may be taken either under local anesthesia alone or in combination with light nitrous oxide-oxygen analgesia. A week or ten days later the operation may be continued or completed.

Lilienthal emphasizes the point that when the individual has made a convalescence, no matter how perfect or brilliant, from an operation for the relief of pulmonary tuberculosis, the disease is still present and the patient must continue to be treated in accordance with the well-known principles of rest and hygiene.

He concludes his paper as follows:

Surgery is not intended to supplant medicine in the treatment of tuberculosis of the lungs. It should be resorted to when medical and hygienic treatment have nothing more to offer and the patient's life is intolerable or the prognosis is grave.

Operation may have two distinct objects: First, the placing at rest of an entire lung, and, second, the obliteration of apical cavities.

Collapsing thoracoplasty, with phrenic nerve resection, puts the lung at rest to a greater degree than is possible by any other known method. It is only to be applied when the other lung can function sufficiently to support life, and when it is not affected by rapidly developing tuberculosis.

Thoracoplasty does not take the place of therapeutic pneumothorax, for no return of function is possible. In pneumothorax lung function can be restored, when desirable, in a large number of cases.

Arrest or great improvement following collapsing thoracoplasty may be expected in about seventy-five per cent of the cases.

The obliteration of apical cavities can be done on both sides of the chest. It is worth performing the operation when the disease in the remaining parts of one or both lungs is capable of arrest.

The operations here discussed are sufficiently safe to be recommended in properly selected cases.

The surgeon must never lose sight of the fact that although his wound may heal and his immediate objective be reached, his patient still has tuberculosis and will long require medical and hygienic treatment.

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### Furunculosis of the Nose.

TOLAN *(Wisconsin Med. Jour.,* Jan., 1924) calls attention to the seriousness of the so-called trivial boil, or small pimple, in the vestibule of the nose and on the upper lip. He notes that it is evident that any process, which would cause a thrombosis of the veins in the region of the nose and upper lip, will present a picture which will vary with the direction of the extension, be it by the ophthalmic back to the cavernous sinus, or through the foramen cæcum to the superior longitudinal sinus, or by the facial directly to the internal jugular, which is usually followed by metastasis to the lung and heart.

The staphylococcus is the common organism, although it may be a mixed infection. The predisposing causes are the same as for furuncles elsewhere on the skin, plus the pernicious habit of pulling out hairs and picking and squeezing small pimples in this region.

It usually begins with a small, insignificant looking pimple, but very painful due to the density of the tissue in this region. It progresses to a small furuncle, the tissue becomes infiltrated, and usually there is a chill and rise in temperature. The swelling has the consistency of hard dough. It may extend to the forehead and temples. Usually the eye on the affected side is closed.

From here on the symptoms and signs depend upon the avenue of extension. With thrombosis of the ophthalmic veins there is usually swelling of the lids, which closes the eye; a purulent discharge from between the lids; a suppuration in the orbit; marked exophthalmos and edema of the retina. Then the neighboring nerves become involved, causing ptosis and dilatation of the pupil, loss of vision and fixing of the eyeball. Finally the picture of general sepsis supervenes—chills and sweats, temperature ranging from 97° to 105°, pulse weak and thready.

A history of severe headache, septic temperature, chills, edema of the retina, exophthalmos, especially when it involves the other eye in a short time, is pathognomonic of thrombosis of the cavernous sinus.

If the thrombosis extends along the facial and metastasizes to the lungs, the picture will be that of a lung abscess or a pneumonia.

In like manner, if the meninges are attacked the clinical picture will be a meningitis.

Chisholm and Watkins report two fatal cases of cavernous sinus thrombosis. D. Smith reports five fatalities from this condition; von Wacker reports one fatal case. Riverdin collects forty-five fatalities from the literature on furunculosis of the face. Of these cases twenty-two were in the nose or on the upper lip. Hofman reports 182 cases of furunculosis of the face, 111 of which were of the nose and upper lip, of which 15 died. Eight of these were cases in which the nose and upper lip were involved.

Appreciating that it is a surgical rule to open and drain abscesses or other accumulations of pus, men in the specialty feel that best results do not always follow strict adherence to this principle. When a patient presents himself with a small furuncle in the nose or on the upper lip, we first advise him about putting and keeping the part at rest. If there is crusting wet dressings are applied until the crust can be lifted off without difficulty. Then an antiseptic emollient is used freely to prevent further crusting, hot applications several hours a day, and, in the interval, the area around the process is gently packed with a tampon saturated with 2-per-cent mercurochrome. If surgery is resorted to at all, the incision

should be small and well within the barrier nature has set up around the process. No curetting should be done. If thrombosis of the veins extends to the ophthalmic or toward the jugular, with resulting symptoms, one should consider the advisability of ligating the anterior facial or the common facial. Thrombosis of the lateral sinus, following mastoid disease, is now successfully treated by tying off the jugular.

It is reasonable to expect that the cavernous sinus may overcome an infection if further supply is stopped. At least this is a simple procedure and may save the patient's life. Operation on the cavernous sinus itself has so far been unsuccessful, the mortality being practically 100 per cent.

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### Gonorrhea Cataphoretically Treated by Silver Colloid.

FROST *(Proceedings of the Royal Medical Society*, January, 1924) after a trial of ionization of the silver colloid produced by electrical methods, the silver particles being each about 20 microns in diameter and passing through a Chamberland filter, decided to employ this preparation cataphoretically, since the silver catheter employed for ionization caused much pain. As the colloid employed as a medium is a non-conductor the colloid particles move from the negative pole toward the positive. Bacteriologic experiments with the use of a culture of staphylococci isolated from the urethra showed that 100,000,000 organisms were destroyed in twenty minutes, and 300,000,000 were killed in two and a half minutes by the undiluted colloid. It was shown under the microscope that the electronegative particles of this colloid move toward the positive pole when subjected to an electric pressure, from which it was assumed that given this pressure colloidal particles would be driven into the urethral mucous membrane when a column of the silver suspension is acted upon by a pressure of 60 volts direct current, or over, through the negative pole, with the positive pole attached to a perineal pad. Sixty volts direct current is the minimum pressure which will set the colloidal particles moving toward the opposite pole. After some experimental work on details, the following method of carrying out the treatment was adopted:

A room was wired so that ten patients could be treated at once. The negative wire was attached to a one-inch length of silver tubing which was inserted into the lower part of the rubber tubing of the irrigation apparatus, consisting of a 300-cc funnel and 5 feet of rubber tubing, a glass urethral nozzle being attached. A piece of silver wire was soldered to the inside of the silver tube and extended down to the glass nozzle.

In the application of the method the patient sits on a chair and on the positive pad, care being taken that he does not come in contact with the metal connection. The funnel, suspended on a stand, or by a wire beside him, is filled with colloid silver, air is expelled, and the bladder and urethra are filled with the colloid by pressing the nozzle firmly into the urethral meatus.

The routine adopted is the following: The patient has a dose of twenty million gonococci injected subcutaneously, and his urethra is washed out with lime water to remove pus and mucus, and then with distilled water to remove electrolyte. The patient sits on the chair, adjusts the pad, fills his bladder and urethra, as mentioned, and the voltage is applied for three-quarters of an hour to one hour. If, during the treatment, the amount of fluid in his bladder is causing discomfort, or if the amount of urine is sufficient to act as a conductor, the bladder is emptied and again filled with colloid. This treatment is repeated daily for four days until the patient's urethra is free from discharge. He then goes through a test for cure, and is discharged from hospital when no signs of recurrence are brought out by the test.

If it happens that the urine is not clear at the end of the first set of four applications of silver colloid, the patient receives a second injection of antigonococcal vaccine, and a Kollmann's dilator is passed; immediately after it he is again treated cataphoretically. It has been found that in

those cases which require further treatment there are a number of closed follicles in the urethra, as can be seen by the urethroscope, and that when these are opened the cure can be completed by one or two further applications of the silver colloid.

The test of cure consists of a complete examination of the urethra after irrigation with magnesium chloride (1-in-500 solution) twice a day for two days, preceded by a 100 to 200 million injection of gonococcal vaccine. The examination consists in the introduction of a sound, followed by inspection of the urethral mucous membrane by means of the urethroscope, massage of the prostate and vesiculæ, with microscopic examination of any secretion expressed from them. The urine must be free from pus, and no pus must be present in the urethra.

As to the results, the average number of days of treatment of 107 patients is nine, and the average number of days in the hospital is 29.7 as compared with 69 days representing the average in hospital at two large venereal clinics.

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### The Diagnosis and Treatment of Chronic Latent Tonsillitis.

DALAND (*Atlantic Medical Journal*, January, 1924), observing that the systemic manifestations of latent or chronic infection are more usually observed at or near middle age, notes that such chronic infection may exist twenty or more years without systemic manifestation.

The tonsils may be considerably or moderately hypertrophied, small in size or buried. The anterior and posterior pillars are frequently adherent to the tonsil, and the anterior surface of the anterior pillars often presents a dark-red, congested appearance.

When infected tonsils are subjected to pressure, some yield no secretions, others show a cheesy or thin, milk-like fluid which, when cultured, usually reveals the streptococcus hemolyticus or viridans. The crypts are frequently dilated, and when emptied, and material secured from the bottom by a platinum loop is cultured, the streptococcus hemolyticus or viridans may be obtained in pure culture.

The small buried tonsil, fibrotic tonsil, may give no evidence of infection, and the diagnosis of its infectivity may rest entirely upon the exclusion of all other foci of infection, together with the clinical and leucocytic manifestations of systemic infection. Occasionally the only diagnostic sign is lymphocytosis, polymorphonuclear decrease, and leucopenia.

Infected tonsillar tissue remaining after a tonsillectomy, even though no larger than a split pea, or unremoved infected glandular tissue in the region of the plica triangularis, may produce the same clinical manifestations as an infected tonsil.

Usually, chronic or latent tonsillar infection is preceded by a history of one or more attacks of acute tonsillitis, although occasionally no such history is obtainable.

As a rule, when recurrent acute tonsillitis has occurred, even though twenty years have elapsed since the last attack, the tonsils should be suspected of being infected until proved innocent.

The presence of enlarged, indurated and painless cervical glands aids in diagnosing chronic or latent tonsillar infection, but they may be so situated as not to be detected by palpation.

The most common clinical manifestations of chronic or latent tonsillar infection more or less in the order of frequency are: arthritis, periostitis, tenosynovitis, myositis, chronic myocarditis, endo- or pericarditis, endarteritis, neurasthenia, psychoneurasthenia, psychoses, neuritis, cholecystitis, cholelithiasis, hepatitis, hepatic insufficiency, intestinal toxemia, nephritis, pyelonephritis, renal calculus, peptic ulcer, and infective processes involving the eye, ear, skin, respiratory or genital organs.

When a vital organ is involved, such as the heart or kidneys, and reasonable clinical evidence exists that it is infective in origin, more especially if the polymorphonuclear cells are decreased, with lympho-

cytosis and leucopenia, and no other focus of infection is discoverable, the tonsils may be removed on suspicion.

In more than one-half of the cases of chronic tonsillar infection there is a well-marked increase of the small lymphocytes, a corresponding decrease in the polymorphonuclear cells, and a decrease in the number of leucocytes per cm. Anemia or chloroanemia usually coexists. This diagnostic leucocytic picture may be the chief or only evidence of chronic or latent tonsillar infection and indicates that toxins or microörganisms or both are entering the blood.

The treatment of tonsillar infection, or of an infected remnant, is its complete surgical removal.

When infected tonsils are inoperable, the septa of the crypts may be divided so as to favor drainage. Any antiseptic, such as iodine, or Dakin's solution, may be employed to irrigate the crypts after they have been thoroughly emptied by compressed air or liquid. The *x*-ray properly applied, in proper doses, at proper intervals, sometimes causes a reduction in the size of the diseased tonsils and may reduce infectivity, and should be employed in conjunction with local treatment.

A properly made autogenous vaccine is of value in the senile, the debilitated, and those in whom resistance is lowered from any cause. In healthy, young adults, with no complications, vaccines are usually unnecessary.

Summary of the diagnostic evidence of tonsillar infection, in the order of importance:

The appearance of the pillars to the tonsils. Dark-red, congested appearance of the anterior face of the anterior pillars.

A thin milk-like secretion obtained from the tonsils by expression, containing pathogenic organisms, often in pure culture, usually the streptococcus hemolyticus or viridans.

Pathogenic organisms, usually the streptococcus hemolyticus or viridans, especially when secured from the bottom of the spaces between the tonsils and the anterior and posterior pillars, or from the bottom of a crypt.

Clinical evidences of infection.

Lymphocytosis, polymorphonuclear decrease, leucopenia, usually in association with anemia.

History of recurring tonsillitis or tonsillotomy.

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### Recurrent Cholelithiasis.

DECKER *(Atlantic Medical Journal,* January, 1924) summarizes an article on this subject to the effect that gall-stones reform in about one per cent of cases. Secondary operations are needed in 8 per cent of biliary tract cases. At the second operation, stones are found in 50 per cent of cases. They are true recurrences in about 7 per cent, and "overlooked" or "doubtful" in the balance. The clinical picture of recurrent cholelithiasis resembles that of the primary disease. It depends upon the location of the stones, as well as the condition of the gall-bladder and ducts. Ultimate prognosis in recurrent cases is favorable. Operative mortality is about 5 per cent, and two to three times the mortality for primary operations.

Of etiological factors, infection and biliary stasis are the most important. Less so are the amount of bile salts secreted by the liver and hypercholesterinemia. The presence of gall-bladder increases likelihood of recurrence 50 per cent. Treatment is surgical, and by way of prophylaxis should include painstaking technique at primary operation, cholecystectomy rather than cholecystostomy, and prolonged biliary measures are of less value.

Gibbon writing on "The Contraindications to Cholecystectomy" believes that although cholecystectomy may be the best operation in the majority of cases of chronic pancreatitis, the reverse is true in acute pancreatitis, and if the acute condition is accompanied by jaundice, cholecystectomy is contraindicated.

The removal of the gall-bladder is preferable to drainage in the great majority

of cases. But there will always remain conditions and circumstances which will render the simpler procedure the wiser and safer, and we must not, in our enthusiasm for the radical operation, lose sight of this fact. Nor must we, like mere automatons, take out a gall-bladder simply because we opened the abdomen with this intention. Many of these cases call for the exercise of the wisest judgment, based on a thorough knowledge of pathologic processes and their manifestations, before one decides in favor of either of these two procedures. The decision must be made in each case based on the findings, the patient's condition, the risks and difficulties of the performance, and on the skill and experience of the operator.

Although the field for cholecystectomy has become much larger, let us not fail to recognize that there is still a field for simple drainage. To do either of these operations when the other is indicated is a mistake, but the more serious mistake is to do a cholecystectomy in the presence of contraindications.

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### Treatment of Fractures of the Skull.

DOWNEY *(Long Island Medical Journal,* January, 1924) draws conclusions from one hundred consecutive cases of fracture of the skull. Sixty-five recovered and thirty-five died. The usual signs and symptoms were present, such as unconsciousness, semiconsciousness or coma, severe shock, low pulse and low blood-pressure, spinal fluid bloody with increased pressure, eye findings, neurological symptoms definite, the classical symptoms of bleeding from the nose, ear, or into the orbit, ecchymosis back of the mastoid, and delirium.

In the cases that died, the symptoms in order of frequency were as follows:

| | |
|---|---|
| Shock, severe | 35 cases. |
| Unconsciousness | 33 cases. |
| Semiconsciousness | 2 cases. |

The lowest pulse rate was 35, the highest 168. Nineteen of these 35 cases had other major injuries, such as perforated intestines, compound fracture of the femur, of the ribs, pelvis, vertebræ, etc.

In the recovered cases the most frequent symptoms were as follows:

| | Cases. |
|---|---|
| Shock | 65 |
| Spinal fluid bloody in | 44 |
| Unconsciousness | 33 |
| Hemorrhage from the eyes, ear or mouth in | 51 |
| Disturbed consciousness in | 23 |
| Consciousness | 7 |

Seventy-seven lumbar punctures were done; bloody under pressure in 44 cases. Highest number in one case, 7 punctures (not operated upon).

There were eight decompression operations performed.

The usual treatment in these cases has been conservative and as follows: Treatment for shock (hot-water bags to extremities, morphine, atropine, ice-bag to head); spinal tap for relief of pressure (repeated if necessary) and diagnosis; patient in Trendelenburg position, face down in bed; decompression, if necessary.

Vomiting occurs in few of the cases. Bloody spinal fluid does not always mean fracture of the skull—it may mean laceration of the brain without fracture. It is bad surgery to operate in shock, with pulse over 110 to 120. It usually hastens death, but if pulse drops rapidly to 60 or lower, and there be papilloedema, operate without waiting. If the pulse rate rises rapidly, it is a sign of medullary edema, which has 100 per cent deaths. With definite local signs, operate early.

Sixty-seven per cent of recovered fractures of the skull do not enjoy good health; they suffer from mental disturbances, headaches, etc. These cases should be decompressed even months after the injury, as they are suffering from increased pressure.

The operation of choice is subtemporal decompression, either single or double, as indicated. The incision, either the large semicircular or the straight incision of Sharpe, is largely decided upon by the conditions present, or the choice of the surgeon.

# Reviews

THE ANATOMY OF THE NERVOUS SYSTEM. From the Standpoint of Development and Function. By Stephen Walter Ranson, M.D., Ph.D. Copiously illustrated. Second edition, revised. The W. B. Saunders Company, Philadelphia, 1923. Price $6.50.

Dr. Ranson, who is the Professor of Anatomy in Northwestern University Medical School, Chicago, well describes the scope of his book when he says that he has written it from the standpoint of development and function. There have been many minor alterations or additions made to the present volume. The advances which he considers really important are, for example, the more detailed localization of the visual fields in the cerebral cortex and the additional text to that portion of the text which deals with laboratory procedures. He considers that the other more important additions are a brief account of the blood supply of the brain, accompanied by three colored figures and a series of cuts representing sections through the basal ganglia and internal capsule. He also adds twelve clinical cases which were selected to illustrate the functional significance of various parts of the nervous system.

Large type makes the text easily read. Naturally it is better suited to the advanced student of anatomy and to junior teachers than to professional anatomists. Undergraduate students, with all they have to learn in this and other departments of medicine, will find a large part, if not all, that they actually need in standard works on general anatomy. We are inclined to think that the chapter which will prove most useful to the undergraduate is XXII, devoted to a consideration of the sympathetic nervous system, about which there is much misunderstanding. This is still a large field for investigation, and many of the older graduates know little or nothing about it because in their undergraduate days it was a terra incognita.

We can cordially recommend the present volume to practitioners who wish to refresh and improve their knowledge of the nervous system, and particularly to younger men who are about taking up neurology as a specialty.

THE INTERNATIONAL MEDICAL ANNUAL. A Year Book of Treatment and Practitioners' Index. Forty-second Year. 1924. William Wood & Company, New York, 1924. Price $5.

For almost as many years as this book has appeared we have annually called attention to its scope and excellence. The text is really of British composition, the present volume being made up of imported printed pages. A very noteworthy characteristic is the excellence of the black and white illustrations and the colored plates, which are among the best that we have seen. It will be recalled that the greater part of the text is arranged alphabetically, and, therefore, it naturally begins with Abdominal Surgery and ends with *X*-ray Diagnosis. Altogether there are 528 pages. Naturally, most of the authors are English, and we note that the only American is Dr. J. Ramsay Hunt of New York, who writes upon "Brain Tumors and Other Diseases of the Nervous System." Lian and Petit of Paris contribute the article on "Heart Block," and Pollet of the same city gives a summarization of the literature on "Aneurisms, Angina Pectoris, Arterial Pressure, and Diseases of the Blood Vessels." A copious index concludes the volume.

PATHOLOGICAL TECHNIQUE. By Frank Burr Mallory, A.M., M.D., and James Homer Wright, A.M., M.D. Eighth edition, revised and enlarged. Illustrated. The W. B. Saunders Company, Philadelphia, 1924. Price $6.50.

Some of our readers may recall that the first edition of this very excellent book appeared in 1897. It has reached its eighth edition by virtue of two facts. One is the

excellency of its composition, and the other is the high standing of its authors, who have done much to increase the standing of American pathology throughout the English-speaking world, so that the names of Mallory and Wright mean to progressive physicians in this country as much as Behring and Kitasato, or Roux, mean in foreign parts.

It is to be definitely understood that the title exactly describes the text, which is a practical manual for workers in pathological histology, including directions for the performance of autopsies and for clinical diagnosis by laboratory methods. The text is so excellent that it is unfortunate that some of the illustrations are not as definite and well executed as they might be, as, for example, figure 162, illustrating a section of the brain. Indeed it might be well said that the illustrations do not in any way come up to the value of the text. On the other hand they are sufficiently well reproduced to be useful.

BARRIER CHARTS FOR HEALTH OFFICERS. A Synopsis of Preventive Measures Against Communicable Diseases in Four Tables. By S. H. Daukes, O.B.E., M.D., D.P.H. Bailliere, Tindall & Cox, London, 1924. Price 3s. 6d.

These so-called Barrier Charts of Communicable Diseases have been printed in England for the Wellcome Bureau of Scientific Research. They are designed to emphasize in a special manner those preventive measures in combating disease which are the outcome of long experience and recent research. The charts are printed on cards which are folded so that they may be carried readily in the inside pocket of a coat. Manifestly they are designed for health officers, but in them the general practitioner will find much of interest in regard to the preventive measures which should be taken to combat the spread of various infections.

Chart I deals with infections of the alimentary group, as, for example, cholera, typhoid, and various protozoan parasites. Chart II deals with the inoculation group, as, for example, plague, yellow fever, relapsing fever, acute poliomyelitis, and Oriental fever. Chart III deals with the respiratory group, in which we find smallpox, cerebrospinal fever, tuberculosis, and the eruptive fevers. This group, of course, indicates from its title that the author believes that all of these infections occur through the respiratory tract. The fourth chart deals with the so-called contact group and extends from a consideration of scabies, syphilis, gonorrhea, chancre, tetanus, puerperal fever, and rat-bite fever.

A POCKET GUIDEBOOK TO MEDICAL LIFE INSURANCE. The Oriental Government Security Life Assurance Company, Ltd., Bombay, India.

The editorial office of the THERAPEUTIC GAZETTE has received three small volumes. The first two consist in instructions to medical examiners for life insurance, and the third consists of a historical résumé of the fiftieth anniversary of this organization named above. One volume which is slightly larger than the others is intended for use in the head office of the company, while the shorter one is for the use of medical referees at various agencies. In the Orient, as in the Occident, errors unwittingly committed by medical examiners we are told often result unfavorably to the company.

Evidently in the preparation of the text a great deal of pains has been exercised to include some of the best literature in regard to the heart and kidneys which has a bearing upon life insurance examinations. As an illustration of this, and as indicating the opinion of a celebrated expert upon cardiac murmurs, a quotation is made from Sir James Mackenzie, who, in some public testimony before a Committee of the British Army, stated that men were continuously rejected for life insurance through heart murmurs, but that he would without hesitation pass a man as first grade if an innocent murmur was his only trouble, and, further, that to a man who had been rejected seven times he had given a first-rate certificate.

As the author of this little volume adds, this last statement must be taken by the

ordinary medical examiner with a large grain of salt unless he is an expert heart specialist. Our own feeling is that while Sir James is right in theory, the difficulties surrounding the theory are so great that most life insurance companies will hesitate before they will take risks of this type.

MEDICAL CLINICS OF NORTH AMERICA, May, 1924. The W. B. Saunders Company, Philadelphia, 1924.

This issue of the Medical Clinics of North America is made up of a large number of contributions by physicians resident in Montreal and attached to the various institutions in that city. As in all publications of this character, the articles are uneven as to value, either because of the subjects which are discussed or because of the variation in thoroughness with which the individual considers his theme. Perhaps the articles which would prove the most interesting to the general practitioner are those by Henderson on "The Successful Treatment of Asthma and Related Conditions," by Nutter on "A Study of Sciatic Pain," by Grant-Campbell upon "The Danger of Pregnancy in Heart Disease," and by Hamilton upon "Diabetes and Syphilis."

THE OPERATING ROOM. St. Mary's Hospital, Rochester, Minn. Illustrated. W. B. Saunders Company, Philadelphia and London, 1924. Price $1.75 net.

This brochure is well described by its title. The author states that each institution must develop methods suited to its requirements, but it may gain much by studying the methods successfully followed in other institutions. The text presents the methods employed at St. Mary's Hospital as those being successfully used in an institution doing a large amount of surgical work. They are simple and economical both in the matter of armamentarium and personnel. He believes the modern operating room should be interesting and attractive. The anesthetic is administered in the operating room and the preparation of the operative field goes on at the same time. At St. Mary's ten operating rooms similar in all respects are grouped in pairs with a wash-up and sterilizing room for each pair. Each operating room is two stories high; the arena is 30 feet square; the floor is of gray flint tile in 2-inch units; wainscots, of tile, are 7 feet high. The seat banks and floor of gallery are of terazzo, leaning rails are of polished white metal; the gallery accommodates a hundred persons. Rooms have zenith and north lights, the windows are double.

First is given categorically the Equipment of the Operating Room, thereafter the needful procedures preceding operation, during operation, and after operation. Then comes the preparation of the patient for abdominal operation, and thereafter a list of instruments needful for the various abdominal operations. This scheme is followed throughout the book. Thus under the subhead of Abdominal Hysterectomy Instruments and Sutures come the line of statements: Ordinary instruments; Balfour abdominal retractor (illustrated); long pack (illustrated); tissue forceps (Kelly, illustrated); two tenaculums or Henrotin vulsellum forceps; fibroid hooks (illustrated). The remaining portion of the cervix is swabbed with iodine after the last of the specimen is removed in a subtotal hysterectomy. In a total hysterectomy, 8 inches of iodoform gauze on a Murphy forceps is dipped in iodine and inserted into the vagina. One-third strand No. 2 plain catgut on small cervix needle with Hegar needle-holder (illustrated). After the surgeon has used the catgut on needle, put the needle, needle-holder and tissue-forceps in pan and remove from the table. Two-thirds strand of No. 1 catgut for ligating. Place on table: tissue forceps (illustrated), No. 2 plain double catgut on catgut needle with Hegar needle-holder (illustrated). Bring up change consisting of: wound towels; straight forceps (illustrated); curved forceps (illustrated); tissue forceps (illustrated); cutting scissors (illustrated); sponge (illustrated); ordinary abdominal closure.

Similar brief directions are given for resection of bladder, prostatectomy, Kraske's

operation, kidney operations, hemorrhoids, vesiculectomy, operations on the thorax, on the breast, on the cranium, laminectomy, bone operations—indeed, all the various procedures practiced at the Mayo clinic. The technique of blood transfusion is given briefly, but clearly. Ether anesthesia and regional anesthesia are described.

There is a miscellaneous section covering sterilization of syringes, care of needles, caps and masks, preparation of sets of gloves, solutions, drains, sutures, intern's dressing basket. There are illustrated and described various trays employed, and the instruments most commonly used on the trays are listed.

A most serviceable book, assured of an appreciative reception.

DISLOCATIONS AND JOINT-FRACTURES. By Frederick J. Cotton, A.M., M.D., F.A.C.S. Second Edition, Illustrated. W. B. Saunders Company, Philadelphia and London, 1924. Price $10.00 net.

Cotton has the somewhat unusual gift of proportion, in that his text runs smoothly along, unclouded by minor details, and presenting a singularly clear picture of either the affection he describes or his methods of treatment. In this book are 1393 excellent illustrations, all of them serviceable from the standpoint of a clear understanding of the text. The facts that the work is based in the main on personal experience, part of it acquired during the war, that it avoids main discussions, and is somewhat dogmatic in its assertions, add to its value.

Cotton states that the general practitioner should be able and will be able to treat most fractures, and points out that an *x*-ray plate two weeks after injury would obviate most instances of dissatisfaction or of legal process in cases of fracture or luxation.

It is held that though no book can make a man a fracture expert, a work of the kind Cotton has contributed should teach the practitioner the common types of luxation and fracture, should instruct him in regard to methods of diagnosis, and should teach him, by description and illustration, how to reduce, what apparatus should be used, and how to employ it. It should also warn him of common failures in reduction, and complications which may be avoided by careful watching. Moreover from such a book the practitioner should learn something concerning the after-treatment and prognosis. All these things Cotton's book teaches, and does it well.

The first chapter is devoted to Generalities, including Definitions; *X*-ray in fractures, Repair, Physiology, Therapy, Operative Treatment, Embolism, and a number of other subjects. Thereafter follow chapters on Luxation of the Lower Jaw, Injury of the Cervical Spine, the Dorsal Spine, the Lumbar Vertebra, the Sacrum and Coccyx, the Clavicle, the Scapula, the Shoulder, the Humerus, the Elbow, the Wrist, the Carpus, the Metacarpus, the Phalanges, the Pelvis, the Landmarks of Pelvis and Hip, Hip Dislocations, Fracture of the Hip, and Fractures, Luxations and Injuries of the Lower Extremity.

There is a final chapter on Technic: Splints, Plaster Works, etc.

This book is written by a scholar, a clinician, master of his hands, of great experience, a keen observer, and one whose teaching is so clearly expressed as to be easily followed.

THE SURGICAL CLINICS OF NORTH AMERICA. Mayo Clinic Number. W. B. Saunders Co., Philadelphia and London, 1924.

There have been times when these surgical clinics have seemed of no great value to the profession at large, though always containing articles helpful to the individual. The last few numbers of this publication have been exceptionally useful in that they have been written in the main by men who stand in the forefront of the surgical world and constitute something more than a record of difficult or unusual cases; though the publication of the latter, if done accurately and in sufficient detail, is always serviceable.

This volume is entitled "The Mayo Clinic Number," and among those who contributed to it are Lyons and Judd, who write on Surgery of the Stomach; Balfour on Various Types of Gastric Resection; Mann on

Some of the Affections of the Liver; Charles Mayo and Waltman Walters on The Operative Treatment of Vesicovaginal Fistulas; Foulds, Scholl and Braasch on the Morphology and Histology of Tumors; Pemberton on Obstructive Dyspnea Following Surgery of the Thyroid and its Prevention; Willius on Angina Pectoris and Diseases of the Abdomen; Desjardins and Smith on Radiodermatitis and its Treatment; Adson on Pseudo-Brain Abscess; William Mayo on Surgery of the Kidney and Spleen; and Walters on The Surgical Treatment of Infectious Arthritis.

This partial list of authors and subjects is of itself indicative of the value of the work not only to the surgeon, but to the profession at large.

# Notes and Queries

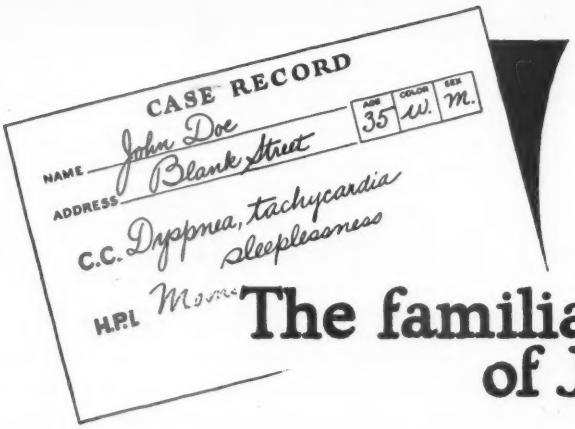
### Bedside vs. Laboratory.

Sweet, in the *Atlantic Medical Journal* for April, 1924, states that all research in medicine starts at the bedside; it may not always look that way, but what we are all trying to do is to help the patient. The problem, therefore, starts with the patient, and will end with the discovered cure. What is perhaps most needed for the advancement of the science of medicine is more accurate, more thoughtful bedside observation of the patient.

He hears of late years, from the older men of the profession, now and then a timid halting criticism of the development of the ultra-scientific view-point of the younger generation. He agrees thoroughly with them in what he thinks they mean, though not always with what they say. The danger in the modern trend is not in the too great development of the scientific methods of diagnosis, but in the tendency toward the separation of the scientific study from the patient. What he means is this: blood from an interesting case is taken to the laboratory, where it is studied as a specimen, coming from no one cares where into a certain, theoretically interesting collection of bloods—but the patient is forgotten. The tendency is toward the development of statisticians, not of practitioners interested in people.

There is a desire to combat this tendency by placing the clinics and the laboratories in closer physical relationship; but it will not help much to put the patient's bed in the laboratory, nor to put the laboratory in the patient's bed, unless the point of view of the actuary can be changed to the point of view of the doctor. This tendency of modern medicine is not helped by the desire to report large series of cases. Five hundred case reports may not be as good as five properly handled.

All this by way of introducing the first thought he wishes to call to our minds. Since all advance in medicine starts from the patient and will eventually return to the patient when the problem shall have been solved, each one of us is in position to do fundamental research work, by more careful, more thoughtful bedside analysis of the patient. He thinks we are not to feel because one has only one case, or only a few cases, we must wait until we have a large series to report. The western ranchman, carelessly cultivating his thousands of virgin acres, has not added much to the science of agriculture. The European peasant with his few acres of seemingly worn-out soil produces twice as much wheat per acre!




# The familiar case of John Doe--

THE case of John Doe should be familiar, doctor, for you encounter it frequently in general practice.

The patient's age may be anything from 17 to 70, but usually it is somewhere in the 30's, when the tenseness of modern existence combines with unwise habits of life in the creation of conditions for your attention.

Usually you hear the frank confession: "Yes, doctor, I drink a good deal of coffee." And you are not surprised. A history of a long-standing coffee habit so regularly accompanies the patient's symptoms that you have come to expect it.

You give your advice to the patient —advice so much a matter of common sense that you wonder why you must give it at all—and you recall statements such as the following from Dr. Lester Taylor's "Clinical Studies on Caffein": "One of the most constant findings was the unpleasant symptoms of the drug. . . . These effects were mainly nervous and gastric. In thirteen of the fifteen cases there was discomfort shown from the drug. Eight of the patients were unable to sleep; seven had nausea; five vomiting; four headache; two could not eat."

Or your thoughts may go back to Prof. Bastedo's famous exhortation to his class: ". . . I should like to say to every student that if he gets into a state in which night after night he cannot work without coffee he is drawing upon his reserves, so that when he needs to make a spurt he will be unable to do so."

As you paraphrase Prof. Bastedo's thoughts in your advice to the patient, you are mindful that reforms in diet are hard to enforce. It is here that Postum can aid you. For Postum, if given a fair trial, will add the patient to the 2,000,000 families who have found Postum amply satisfies their need for a beverage and who like its taste.

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THE PAGES OF

# THE THERAPEUTIC GAZETTE

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To the notes below and on the following pages, also in future issues, we respectfully direct your attention.

Yours very truly,
THE BUSINESS MANAGER,
Box 484, Detroit, Mich.

THE TREATMENT OF DIABETES WITH DIET AND INSULIN.—Diabetes is ten times as rare in persons underweight as in those who are overweight. At the age of 40 it is twenty times as rare in those who are underweight and in people over 50 years it is forty times as rare. Consequently it is largely in our own hands to determine whether diabetes develops. One cannot make this too emphatic, for, if we wish to prevent a disease which is represented by about a million cases in the United States, we must take pains to get at the cause which leads to it. I suppose overweight is not the only cause, but after middle life people who are thin are forty times less likely to contract the disease.

*Early Detection of Disease Important.*—It is just the same with diabetes as with tuberculosis—if discovered early one gets better results with treatment, and it is particularly up to the health officers to see that the disease is discovered early. I would again emphasize what was said in San Francisco the other day at the meeting of the American Medical Association—that every individual should have a physical examination on each birthday. Have your child's urine examined on his birthday. Teach the family growing up in your community the idea of checking up the urine regularly. In that way one discoveres cases early and gets best results. The cases of diabetes discovered by insurance companies do better than any others because they are discovered as a routine before symptoms are marked, and routine examinations constitute the best method. An old lady 79 years old came to my office and I saw her only once. I found she had diabetes and taught her to do the Benedict test and advised her about the diet. She went home and examined the urines of 10 in her boarding house, and some months later a young man told me that this old lady had thus discovered that he had diabetes and she had sent him to his doctor who started him upon his treatment; later, the doctor having died, he came to me.

The other day I took two children to the Academy of Medicine in New York to demonstrate that even children with 9 per cent of sugar are mild cases of diabetes. A patient of mine, a little girl named Olive ——— said, "Freddy Isaac across the street has diabetes." Her mother said, "Oh no, Olive." But she replied, "I know he has diabetes; his legs are weak and he doesn't look strong, and he seems hungry." Because the child was so persistent, the mother finally spoke to a mutual friend of the parents of Freddy Isaac and they took the child to a doctor for examination. The next day Freddy's mother called Olive to her and said, "Freddy hasn't diabetes; the doctor says he has flat-foot." Olive did not like that. The next day she came to her mother. "Mother, I know he has diabetes." The mother said, "You should not keep saying that, Olive, simply because you have diabetes and have it on your mind." "But, mother," Olive replied, "I know Freddy has diabetes, because here is his Benedict test!" If you educate these diabetics, they will check up all the urines of all the people in the country in a few days. You must pay a doctor for urine examination, but patients will do it for nothing. Therefore, utilize them—first, for prevention of diabetes by keeping them thin; second, for discovering the disease early; and third, for prevention of early death from diabetes as now to be described.

*Patients Need Not Die of Coma.*—In the first year of the disease practically all the patients who die, die of coma. This was 87 per cent of my group. In von Noorden's group 94 per cent of all his cases who died under 30 years of age died of coma. Of 600 to 700 fatal cases compiled up to one year ago 66 per cent died of coma. In the last 60 fatal cases only 40 per cent died of coma. As a matter of fact there has been but one death from coma in about the last 500 diabetic cases treated at the Deaconess Hospital. Coma is usually a needless diabetic death. The reasons for coma are: first, overeating; second, suddenly changing the diet, cutting down carbohydrate and continuing a diet of protein and fat. If one keeps his patients from overeating and sugar free and sees to it that they get

enough carbohydrates, they will not die of coma. It is very important for every diabetic patient in the country to know what to do to prevent coma. I tell my patients that it is a disgrace if they die of coma. I mean that right to the limit. They often ask what the symptoms are. It does not make any difference what the symptoms are. Even doctors and nurses cannot always tell, and how can patients be expected to know?

*The Prevention of Coma.*—The rule is, if a diabetic patient feels "sick" he should begin prophylactic coma treatment:

(1) Go to bed. By staying in bed he reduces his metabolism. It does not do anyone any harm to go to bed for a few days.

(2) Drink liquids. We teach the patients to drink hot liquids, coffee, tea, broths, orange juice or oatmeal gruel. If given ice water they will vomit. If they cannot take liquid by mouth they must get it some other way, and the simplest other way for patients is by enema. Consequently all these patients are taught, besides going to bed and taking liquids, to—

(3) Take an enema. Liquids can be given by the bowel if need arises and moreover the enema removes the constipation.

(4) Get a nurse. This does not always mean a trained nurse, but someone in the family to act as a nurse and save the patient from exertion. Rest is essential.

(5) Keep warm. Patients in beginning coma are often restless and may get chilled.

While carrying out these orders send for a doctor. He may give cardiac stimulants, digitalis and caffeine. If the patient is not taking much liquid, it is desirable to give salt solution and one should not hesitate to give it under the skin. Don't delay the treatment because the first hour is worth the rest of the day. Instant action is what counts. Perhaps it will be necessary to wash out the stomach because, presumably, the patient has been overeating.

Another important thing to remember in the prevention of coma is the rule that with rise of temperature the patient should go to bed immediately. Fever often precedes coma.

*Treatment with Insulin.*—Now a word about insulin. There is no value in using insulin unless you use the diet with it. Insulin must be combined with the diet to be of service; otherwise it is wasted and the patient placed in danger. I cannot enter into the story of how insulin was discovered save to say that for years people have tried to find a potent pancreatic extract. The "islands of Langerhans" in the pancreas were discovered in 1869 by a German scientist named Langerhans. Various observers suspected that the internal secretion of the pancreas, which prevented diabetes, was formed by these islands, but before Banting and Best no one was successful in obtaining this secretion. Having read that if the external duct of the pancreas through which its digestive juices flow into the intestines is tied off, all of the pancreas except the islands of Langerhans will atrophy, they proceeded to ligate this duct in a dog. After about ten weeks they killed the animal, extracted the atrophied pancreas with Ringer's solution, and injected the extract into a dog made diabetic by the total removal of his pancreas. Immediately the percentage of sugar in the blood and in the urine fell. Little by little Banting and Best extended their observations with the help of many others in the University of Toronto, and eventually they showed that one could make an extract of the pancreas from animals killed in the abattoir. Having perfected the extract in various ways, Dr. Banting first tried it upon himself and then upon patients.

*Precautions To Be Taken.*—After insulin is given a diabetic patient, the blood sugar, which may have been increased to 0.34 per cent, will drop within a few hours and sometimes to normal—0.10 per cent. This decrease depends upon the amount of insulin used. If too much insulin is given then the blood sugar falls below normal and a reaction appears which is manifested by weakness, unusual hunger, tremor, sweating and even convulsions and unconsciousness. All of these symptoms quickly disappear if a few teaspoonfuls of glucose or the juice of an orange is taken. When the insulin is given it should be followed within half an hour by a meal containing carbohydrate. Little by little one can determine how much carbohydrate can be allowed the patient. Along with the carbohydrate one can give protein and fat sufficient for body needs. Prior to the introduction of insulin, one could give only very small quantities of carbohydrate to diabetic patients, because sugar would appear in the urine. With the small quantities allowed it was dangerous to give much protein and fat for fear of acid poisoning. With insulin, sufficient carbohydrate can be given so that if a patient intelligently follows his diet he can receive enough protein and fat to maintain health and strength.

A second danger from insulin is that with